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Nekoosa-Edwards to Refinance Bond Issue

Outstanding $2,000,000 Security Issue Will Be Redeemed By New Issue of Sinking Fund Bonds and Three-Year Bank Loan—Plan Approved At Special Meeting of Nekoosa-Edwards Paper Co.

Stockholders of the Nekoosa-Edwards Paper Company, at a special meeting held at the company office in Port Edwards, approved the plan of refinancing the outstanding $2,000,000 bond issue of the company which was presented to them by John E. Alexander, president and general manager of the company. The plan as adopted had been approved by the directors on September 20.

The outstanding bonds are being redeemed from the proceeds of a new issue of $1,600,000 First Mortgage 4¼ per cent Sinking Fund Bonds, due October 1, 1955, and a $400,000 term bank loan due in one to three years, together with other funds of the company. It is understood that the financing was arranged by the company through Harris, Hall & Company of Chicago, the new issue of bonds being sold privately to two insurance companies and the term bank loan being made by two banks.

As in the case of the old mortgage securing the bonds, the new bonds will be secured by a first lien on the present and future real estate, plants, machinery and franchises of the company, excepting timber and residential properties.

Bank Loans for Balance

The new bonds will be 15 year serial bonds bearing an interest rate of 4 and one quarter per cent, with annual retirement running from $100,000 to $150,000.

To make up the difference between the new bonds and the amount of the old bonds to be refunded, the stockholders authorized the borrowing of $400,000 from banks on serial notes bearing 2⅜ per cent interest, maturing $100,000 in 1941 and $15,000 each in the years 1942 and 1943.

It is planned, Mr. Alexander stated, that the refinancing would be made on October 1 and that the old bonds would then be called for redemption on January 1, 1941, the next interest date. The total sum required for this refinancing operation and redemption would amount to $2,200,000 for principal, interest and premiums. The additional $200,000 required over and above the new bonds and bank loans, Mr. Alexander said, would be paid from treasury funds of the company or may be provided in whole or in part by additional short term bank loans.

Makes Substantial Saving

The refinancing of the present bond issue will result in a saving of $77,500 in interest costs for the year 1941, on the outstanding $2,000,000 in bonds and a resultant annual saving thereafter of more than $63,500 in cost of interest and premiums. The old bond issue, which was extended in 1936, bears 6 per cent interest and the provisions of the extension were that 1 per cent premium on the principal be included when repaid, which brought the annual rate to 7 per cent.

The present bonds, which will be called and paid on January 1, next, will be at $107 on each hundred dollars of principal.

The refinancing program, Mr. Alexander said, was worked out by him within the last thirty days in cooperation with the Board of Directors and Harris, Hall & Company of Chicago, and has no connection with any other previous negotiations with any other financial institutions or by any effort on the part of any former executive of the company.

Prospects for Dividends

That question was asked, Mr. Alexander said, at the stockholders meeting as to the origin of the refinancing program and the statement regarding the negotiations was made Wednesday.

Another question, which stockholders asked and which Mr. Alexander said he answered, was with respect to dividend policies of the company. The new bond issue, being far less restrictive than the old issue will permit a return to stockholders in the form of dividends much earlier, if the earnings of the company justify distribution of profits.

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 9, 1940—Government Printing Office has received the following bids for 19,500 sheets of 31 x 37 yellow railroad board; Mudge Paper Company, $58.50 per M sheets; Whitaker Paper Company, $53.24; R. P. Andrews Paper Company, $54.77; Stanford Paper Company, $54.75; Paper Corporation of U. S., $54.35; and Barton, Duer & Koch Paper Company, $54.62.

Two Parties Negotiating for Lake Sulphite

Mill of Lake Sulphite Company At Red Rock With Rated Capacity of 540,000 Pounds of Bleached Sulphite Pulp Daily May Be Bought By One of Two Groups Interested In the Property.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., October 7, 1940—Two groups are currently negotiating for purchase of the properties of the Lake Sulphite Company, Limited, now in receivership, according to the Financial Times, of Montreal. The company's mill is situated at Red Rock in the Thunder Bay District. It has a capacity of 540,000 lbs. per day of bleached sulphite pulp, cellulose for rayon and refined sulphite screenings.

Construction Stopped Pending Reorganization

The construction of the mill was suspended pending reorganization, and G. S. Currie, of Montreal, is the receiver and manager. The Financial Times says: "One of the syndicates negotiating for the property, it is understood, represents American capital, and should they come into the picture they would in effect be taking over the properties outright by purchase.

"The other syndicate includes certain interests in Canada who have shown an interest in the property for some time. Their plan would involve a reorganization of the company, and allow something for the junior security holders as well as the noteholders. Carrying out of their proposal, however, is contingent on an assured market for the output of the new mill, when completed; on advance sale of all the output before new capital is provided, and the plant completed. According to latest reports, fully half of the potential output of the completed mill has been signed up for, with prospects for sale of balance promising, in view of present higher prices for pulp and outlook for continued rising demand, particularly in the United States.

Sound Backing Proposed

"Under either plan, if consummated, there would be sound backing for the completed project. In fact, the Ontario government has insisted that any reorganization or sale of the property must be such as to assure that there will be no financial or other difficulties in the future.

"Back in 1938, shortly after the company was declared bankrupt, U. S. interests submitted plans to the Ontario government for construction of a $6,000,000 plant, but before approving the project the government insisted that the entire amount be deposited in cash, in this country, and definitely earmarked for the undertaking. The U. S. interests offered $2,000,000 cash for immediate deposits, but the government turned down the project as the entire amount was not deposited.

"Since then, various other offers have been made, and plans considered, but none has met all government requirements, or been satisfactory to debtors and security holders of the present company.

Over 4½ Million Invested

"Outstanding is about $1,250,000 notes and $3,300,000 common stock—a total of over $4,500,000 cash already invested in the property. In addition, there are bank loans of about $500,000, and other minor claims against the properties."

Mexico Open to Canada

"At the present time the Mexican paper market offers opportunities for the sale of other varieties of paper in addition to newsprint," states A. B. Muddiman, Canadian Trade Commissioner in Mexico City in a report to the Department of Trade and Commerce at Ottawa. Norway and Finland supplied Mexico with cellulose previous to the war, he reports. "Recently Canadian firms have been obtaining some business and, if the present situation continues, they should be able to secure a much large share of the trade."

Mexico received many types of paper from Germany and other European countries but with these sources of supply cut off, Canada may possibly increase its sales to Mexico by taking advantage of the opportunities offered. Besides possibilities in newsprint and cellulose, markets exist for wood-pulp, blotting paper, coated papers, bond papers, cellulose tissue, cigarette paper, waxed paper, air-mail paper, wood-pulp board, white cardboard for folding boxes, colored cardboard, ivory and bristol boards, and paper specialties.

New Power Plant in St. Maurice Valley

In the St. Maurice Valley, center of the newsprint manufacturing industry in Quebec Province, two of the four units of the new La Tugue power plant of the St. Maurice Power Company, a subsidiary of the Shawinigan Water and Power Company, have just been brought into operation.

The project was initially planned to develop 162,000 h.p. in 4 units of 40,500 h.p., but the 2 units just brought in will each develop 44,500 h.p. as will the 2 additional units to be brought in subsequently, which will give the plant a total initial capacity of 178,000 h.p.

This new power will be used largely by newsprint plants, and will permit diversion of existing power from them to war munitions plants.

Kennebec Paper Co. Gets Big Order

AUGUSTA, Me., October 7, 1940—The Kennebec Pulp and Paper Company of this city received a $79,800 army order for toilet tissue recently one of several totalling $486,084 awarded Maine companies or companies with Maine sources approved by the Labor Department under the Walsh-Healey Act.

The award was made to the Bogart Paper Company of New York City, representing the Hudson Pulp and Paper Corporation which operates the Augusta firm.

Officials said the order was one of several army contracts awarded the Augusta firm in recent months, but added the national defense program was increasing the size and frequency of orders.

Payrolls of Wisconsin Mills Reflect Gains

Industrial Commission Reports Weekly Wages Increased 2.4 Per Cent From July to August With Pulp Mills Operating At Capacity —Cannard Mfg. Co. To Move Converting Plant — Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., October 7, 1940—Although the number of workers in Wisconsin mills has remained about the same for June, July and August, the estimated weekly payrolls have shown marked increases, according to reports issued by the Wisconsin Industrial Commission. This reflects in part the wage increases granted in some of the larger mills, and also the increase in working hours to take care of increasing business. Many of the mills, especially those producing commercial pulp, are now running at capacity to make up for the shortage of European imports.

The number of wage earners reported for June was 21,900, and for July and August, the total is 22,300. Estimated weekly payrolls, however, were $577,000 for June, $581,000 for July, and $595,000 for August, an increase of 2.4 per cent from July to August.

The average earned per week per worker on the basis of these figures was $26.73, average hours worked per week, 41.2, and average hourly earnings, 64.9 cents.

Stability of Employment Indicated

Stability of employment is shown by the commission's figures on unemployment compensation. During the six years the law has been in effect in Wisconsin, the paper mills have contributed slightly more than $3,000,000 to individual manufacturers' reserve accounts. Less than seven per cent of the total has been paid out in benefits to employees laid off. Seventy out of 96 employers have built up their reserves to the point where they are now paying in at the rate of one per cent of payrolls. Eleven have built up sufficient reserves so as to obviate further assessments.

Cannard Co. to Move Plant

Arrangements are being made by the Cannard Manufacturing Company, paper converters of Green Bay, Wis., to move their plant to Little Chute, Wis., according to announcement made by the Little Chute Business Association.

The Association plans to erect a building 60 by 100 feet on Madison St., and the Cannard company will purchase the building under contract. The structure will be of steel and concrete blocks. Machinery will be moved from Green Bay, and the plant will be modernized entirely. Twenty persons will be employed.

Operations at Patten Mill Site Progressing

Practically all the frame work is in place for the new power plant of the municipal utility at Kaukauna, Wis., located on the site of the former Patten Paper Company mill. Bricking of the walls will be started within a few days. One 2,400-kilowatt generator will be installed, and space provided for another unit to be added later. A water wheel with 3,200 horsepower has arrived for installation. Some work still needs to be done on walls of the power dam, but the plant will be able to operate as soon as the machinery is installed.

In the meantime, the former Patten mill is being renovated by the Sangamon Paper Company, Chicago, which plans to begin operations as soon as power is available. The machinery is being reconditioned preparatory to the manufacture of coarse papers. The company acquired the mill from the City of Kaukauna.

Wolf Reservoir Co. Would Issue Securities

Authority to issue $90,000 in capital stock and $225,000 in first mortgage bonds has been asked of the Wisconsin Public Service Commission by the Wolf River Reservoir Company. The bonds will cover lands and other assets now held by the organizers. The capital is desired for the construction of a dam on the Wolf River near Lily, Wis., and preparation of adjoining lands for the large storage reservoir which is to augment the water supply for paper mills of the Fox River Valley. A public hearing will be held on the proposal October 8.

Hauptli-Worthing Nuptials

The marriage of Robert W. Hauptli of Dubuque, Iowa, and Miss Janet Worthing of Fond du Lac, Wis., took place September 28 at Plymouth Congregational Church at Fond du Lac. Mr. Hauptli is associated with The Maizewood Insulation Company at Dubuque. Both were students at Lawrence College, Appleton, Wis. The couple is making a honeymoon trip to Canada, and will be at home after October 20 at 1509 Hennion St., Dubuque.

Atlas Wall Paper Mills Files Answer

WASHINGTON, D. C., October 9, 1940—Atlas Wall Paper Mills, Inc., of Coal City, Ill., has filed an answer to the complaint recently issued by the Federal Trade Commission. The complaint charges the respondent with disseminating misleading representations regarding the character and qualities of certain of its products through the use of the words "washable," "water resisting" and "color fast" and the legend "printed with the best non-fading colors obtainable."

The respondent admits in its answer having disseminated the statements charged regarding the character and quality of certain of its products but denies that such representations are false and misleading or have the capacity and tendency to mislead and deceive the purchasing public.

The respondent asserts that the representations and statements made with respect to the character and quality of certain of its products are understood in the trade and by the purchasing public to have a special meaning and when considered in the light of that special meaning such representations and statements are true.

Supreme Court Authorizes Sale of Abitibi

Final Disposition of Assets of Abitibi Power & Paper Co. Cause of Considerable Controversy Between Government and Opposition —Company Is Also Important Contributor To Canadian Exchange.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., October 7, 1940—The chief topic in financial circles in Ontario and Quebec, and perhaps across Canada, remains the foreclosure sale of the assets of the Abitibi Power and Paper Company, Ltd., set for October 16, as authorized by the Supreme Court of Ontario a couple of weeks ago to satisfy the claims of a bondholders' protective committee.

There seems to be a suspicion in the minds of some people that the deal has political ramifications that have not yet been brought to the surface. This suspicion seems to exist even after discounting fully the eager watchfulness of Col. Geo. A. Drew, leader of the official opposition.

Abitibi on Important Enterprise

This much is known to all:

The company has been in receivership since 1932. It owns considerable property. It holds shares in another operating company. Its various activities give employment to a large number of people. The sale of its products outside Canada helps the exchange situation. New money from outside helps win the war. No one wants to see the company's operations come to an end. The bondholders pressed for a judiciary sale, proposing a plan of re-organization embodying a reserve bid, as explained on this page last week, which the Supreme Court granted. The reserve bid was not made public. The main assets of the company are the many thousands of square miles of timber limits, which really belong to the public, the people of the Province of Ontario, but on which they have cutting rights.

If the exchange situation were more favorable, it is argued by many, and British and United States capital had half a chance, there would be spirited bidding against any reserve offer of the bondholders for so desirable an investment.

Sale Not Approved by Province

The Province was careful to let the court know that it did not approve of foreclosure sale under present conditions and that it reserved the right to hold back the timber limits, which are absolutely necessary to the company's existence and functioning. The Bondholders' Protective Committee makes this clear in advertising the sale.

Col. Drew, the leader of the opposition, has intimated that the government has changed its position. He has declared that until last year the ordinary small shareholder had every right to believe that he was being protected by a committee representing very large blocks of preferred stocks. In a previous statement Col. Drew had said that this committee representing preferred stockholders was headed by J. H. Symington, K. C., of Royal Securities Company, Montreal, and now chairman of the Bondholders' Protective Committee.

Premier Defends Government

Provincial Premier Hepburn, in defense of the Government's position in the matter, has stated that bankruptcy laws emanate largely from Federal authority and intimated that the Province was powerless in preventing the judiciary sale, though admitting that the Province could still withhold the timber rights except for the fact that it would involve the stoppage of work on the properties and cause unemployment. He also expressed the opinion that federal authorities, as a war measure, could stop the sale by declaring it not in the public interests at this time. Col. Drew claims that the Province could stop the sale without stopping operations on the property by the simple expedient of restoring an Order-in-Council dated June 24, 1937, at which time, he argues, the Government must have thought it had full control over the assets of the company when it stipulated a condition that the disposition of the assets of the company must be satisfactory to the Government if there was to be a renewal of the rights over which the Government had control. The Government has not hesitated, Col. Drew says, to exercise authority in enforcing proration of newsprint sales under an act known as the Forest Resources Regulation Act. The Conservative leader claims further that it was due to the Government's action under the provisions of this act, that the Abitibi Company now has nearly $18,000,000 in liquid assets and was in a position to pay interest on the bonds if it so desired. He claims that Abitibi benefited more than any other company by the proration enforced by the Government. Col. Drew argued that no individual or group of investors would think of making an offer under the foreclosure plan unless they had a positive understanding with the Government that any reorganization carried out after the sale will be approved by the Government, no matter what disposition is made of the rights of the different classes of investors.

Timber Rights Most Valuable Asset

Everyone is perfectly well aware that it is the timber rights that are the valuable assets of the Abitibi Power and Paper Company. It was these assets that led the bondholders to lend their money and take back bonds in the first place and they were the assets that induced men to buy the preferred and common stocks with their savings.

In the meantime many bondholders have been restive recently as they noted that free bonds have been bringing higher prices than certificates of deposits owned by those who have placed their bonds with the Bondholders' Protective Committee.

A ruling by the Foreign Exchange Control Board indicates that until further notice, permission will not be granted for the export of Abitibi Power and Paper "free" bonds, but export of the certificates of deposit for this issue will continue to be allowed as

Canadian "foreign" securities in the case of resident switches. This is to protect the country against the loss of foreign exchange, which would otherwise result if the sale of the properties is effected to the Bondholders' Protective Committee, which has a large advantage over other bidders, being able to tender deposited bonds at full face value plus unpaid cupons. In this case, holders of "free" or undeposited bonds will be paid their share of the sale proceeds in cash, and payments to foreign holders would require United States exchange.

Motion to Postpone Sale Filed

Messrs. White, Ruel and Bristol, solicitors for the Noranda Mines, holders of $50,000 par value first mortgage Abitibi bonds, filed notice of motion in the weekly court office at Osgoode Hall on October 5 to postpone the sale of the assets of the Abitibi Power and Paper Company, Ltd. The motion is to come up for hearing on Thursday next, Oct. 10.

The motion also asks for an order directing the receiver and manager, G. T. Clarkson, to pay out to the bondholders interest from the moneys in his hands available for the payment of bondholders and derived from the operations of the company.

Paper Investments Loses

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., Oct. 7, 1940—Canadian Power and Paper Investments, Ltd., reports for the fiscal year ended July 31, 1940, net loss of $14 after interest, exchange, income taxes, provision for depreciation on investment securities and all other charges. This compares with a net loss of $12,920 for the previous year.

The balance sheet shows investments of $4,555,271 with a market value of $1,046,100 compared with investments of $4,662,449 with a market value of $1,192,193 at the end of the previous year.

The portfolio comprised 55.52 per cent public utility securities and 20.01 per cent pulp and paper securities, compared with 70.14 per cent and 18.38 per cent respectively, at preceding year-end.

Sorg Fire Not Serious

The Sorg Paper Company, Middletown, Ohio, reported on October 8 that the damage caused by fire which occurred in one section of pulp stored in the Smith Mill, caused no damage to the paper machine or any equipment in that unit. All electrical and steam power was purposely shut off as a safety measure. The damage was confined mainly to the pulp in storage and operations in the Smith Mill will be resumed this week. No other division or pulp in storage by the company was affected by the fire.

Ohio TAPPI to Meet at Hamilton

The Ohio Section of the Technical Association of the Pulp and Paper Industry will meet at the Anthony Wayne Hotel, Hamilton, Ohio on Thursday evening, October 24th at 6:30 P.M. J. P. Strasser of Stein, Hall Manufacturing Company, Chicago, Ill. will discuss development in the use of starch in the paper industry and A. W. Brandt, Jr. of the Market Development Division of the American Rolling Mills Company, Middletown, Ohio, will discuss new applications of stainless steel in the paper industry.

Northern Kraft Corp. to Expand

The Northern Kraft Corporation, which recently bought all the sulphate pulp-making equipment formerly owned by the Advance Bag and Paper Company at Howland, Me., and placed the plant in operation on September 7 is building additional equipment and will install another digester next month. At the present time the company has in operation four digesters averaging around 60 to 65 tons daily.

The company is using approximately 90 per cent of spruce wood and 10 per cent balsam. Several hundred tons of this pulp have been already made into paper and the results have been unusually satisfactory.

St. Regis Dissolves Subsidiaries

R. K. Ferguson, president of the St. Regis Paper Company has announced that, effective October 1, 1940, St. Regis Kraft Company, Panelyte Corporation and New Hampshire-Vermont Lumber Company, subsidiaries of St. Regis Paper Company, were dissolved and the assets acquired by St. Regis Paper Company.

Hereafter these properties will be operated as divisions of the St. Regis Paper Company. There will be no change in the policies or conduct of the business with our valued customers and other business connections.

Reading Container Signs With Union

READING, Pa., October 5, 1940—Signing of a contract with the Reading Corrugated Container Company, Grace and Meade streets, was announced last week by the recently organized Reading local of the Pulp, Sulphite and Paper Mill Workers, an affiliate of the A. F. of L.

The contract provides for a $4-a-week wage increase and a union shop, and was negotiated between officials of the company and William J. Katz, business manager of the local, and Morris Wray, international representative.

I. L. Gartland Heads Bare Paper Co.

I. L. Gartland has been elected president and chairman of the executive committee of the D. M. Bare Paper Company, Roaring Spring, Pa., at a meeting of the board of directors, it was announced this week. At the same time, Ivan E. Garver, until now president of the company, was elected chairman of the board of directors. Carl Martin was named treasurer to succeed L. F. Garber, who has retired. Mr. Gartland became associated with the D. M. Bare Paper Company in 1935 as general sales manager and in 1938 was elected vice president and director.

Japanese Newsprint Output Less

WASHINGTON, D. C., October 9, 1940 — The Japanese paper industry during the first quarter of this year continued to be characterized by rigid restrictions on production, especially of newsprint. The difficulties in securing adequate wood pulp supplies and chemicals act as brakes on an expansion of the industry which would be natural in normal times. Production of newsprint reportedly amounted to 66,639 short tons, during the first 4 months of 1940, a decrease of approximately 20 per cent.

Midwest Market Firm Under Fair Demand

Chicago Paper Merchants Await Definite Sign of Expected Improvement and Possible Upward Revision of Current Quotations—Paper Men To Be Active In Safety Work — Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., October 7, 1940—The Chicago paper market continues to await any definite signs which will forecast the exact trend for the next few weeks. No change is reported over last week and even a casual interviewer finds jobbers having trouble moving their goods and manufacturers faced with heavy costs of production which seem to make an upward revision in the price structure almost mandatory.

No markets, at least locally, reflected this uncertainty as prices held firm and demand in some cases, rose to the point where it could be characterized as "spotty." Sulphite remained unchanged with demand running slow for the most part. Uncertainties prevailed likewise in the kraft market, according to local reports where any heavy amount of retail demand failed to materialize. Bonds and ledgers found the buyers somewhat hesitant because of the unpredictable trend of general basis but here, as in other lines, it was the common belief that national defense spending would sooner or later develop a very specific higher trend. Books and covers were indisposed to change, following the same cautious groove as in past weeks. Groundwoods and newsprints were said to be in fair demand. Waste papers were only fair according to local reports.

Paper Men Active in Safety Work

The Paper and Pulp industry is again to take an active part in the National Safety Congress and Exposition which meets for the 29th consecutive time at the Hotel Stevens in Chicago. On October 7 D. B. Chant, general chairman and secretary of the Ontario Pulp & Paper Makers' Safety Association of Toronto, will preside. The general subject of "Safe Handling of Materials" will be featured by short talks given by J. F. Robertson of the Crown Willamette Paper Company and J. A. Long, superintendent of the Bay West Company. Following a discussion, F. W. Braun, vice president of Employers Mutuals and chairman of the Statistics Committee of the Paper and Pulp section will discuss and review the 1939-1940 accident experience.

The following afternoon a discussion of practical uses of accident cost data in the safety program will be featured with talks by Earl E. Grant, president of the Crystal Tissue Company and J. A. Draper, safety director of the Consolidated Paper Corporation. Following a discussion reports of special committees will be given with D. S. Garber of Hummell & Downing Company and E. D. Chapman, R. R. Donnelley & Sons reporting on the work of the Paper Products Manufacturing and Printing and Publishing committees respectively. On the afternoon of October 9 the Paper and Pulp session will meet jointly with the Wood Products Section with J. C. Wilson of the Lumbermans Mutual Casualty Company presiding. On this program will be addresses by J. E. Cantin, Quebec North Shore Paper Company; F. H. Stafford, Chapman & Dewey Lumber Company; G. R. Vaughan-Evans, Anglo-Newfoundland Development Company and C. E. Wilds, The Brown Paper Mill Company.

On the same day A. Scott Dowd will report on the 1939-1940 Safety Contest and contest awards will be presented. The closing session will feature a demonstration given by R. W. McLaughlin of the Liberty Mutual Insurance Company.

Salesmen Sponsor Golf Outing

A report on the Fall meeting of the National Paper Trade Association would not be complete without the story of the wind-up golf outing sponsored by the western division of the Salesmens Association of the Paper Industry. The entire event, held at the Olympia Fields Country Club, was under the direction of F. D. "Pat" Patterson of the Flambeau Paper Company who sang his "swan song" as chairman of the golf committee on September 26. He reports that attendance wes exceptionally good with a larger number of visitors than ever before. Over 140 played golf and nearly 150 were present at the banquet. W. J. Tilden, Mead Sales Company, Chicago, shot a 77 over No. 1 course to win the low gross prize.

Other prize winners: 2nd low gross, Gene Hamnes, Graham Paper Company; blind bogey winners, T. F. Donoghue, Riegel Paper Corporation and Phil Maas, Rockwell-Barnes Company; low net winners R. E. George, Tomahawk Kraft Paper Company; R. O. Warner, Minnesota & Ontario Paper Company; A. G. Shennon, International Tag and Salesbook Company; N. T. Fortney, Butler Paper Corporation; Ed Hayburn, Bradner Smith & Company; Gilford Henderson, Browne Company; W. J. Shaar; James H. Sweet, American Writing Paper Corporation; H. M. McCarthy, Minnesota Paper and Cordage Company; J. I. Heyer, Cherry River Paper Company; Burt B. Fisher, Bergstrom Paper Company; Leonard Kuehl, Flambeau Paper Company and Frank Haggarty, Haggarty Paper Company were all low putts prize winners. The high gross foursome was made up of Ed Hayburn, D. M. Cuyler, Whitaker Paper Company, Graham E. Olson and J. H. Sweet of American Writing Paper Corporation. Low net foursome winners were W. J. Tilden, J. I. Heyer. J. C. Marvin, Bermingham & Prosser and H. M. Early, International Paper Company. The low putt foursome, F. Huff, Central Tag Company; E. M. Vana, International Tag and Salesbook Company; A. G. Shennon of the same company and Herman B. Berge of the Appleton Coated Paper Company.

Corwine Roach Nominated to Chamber

Corwine E. Roach, prominent Springfield business man and head of the Capital City Paper Company of the downstate Illinois city, has been nominated as a director of the Illinois Chamber of Commerce. Elections will be held next week and inasmuch as there is no contest reported Mr. Roach will undoubtedly become the second paper executive to serve the State Chamber in an official capacity. The first is

(Continued on page 16)

Obituary

Wendell Butterfield

Wendell Butterfield, supervisor in the Eastman Kodak Company paper mill, passed away suddenly in his home on August 25 as a result of a heart attack.

Mr. Butterfield was born in Middletown, Ohio, on February 17, 1877. He spent his life in the paper industry. His first employment was with the W. B. Oglesby Paper Company of Middletown where he worked from 1893 to 1913, except for a short time in 1910 when he was at the Marathon Mill at Wausau, Wisconsin. In 1913 he moved to Philadelphia to

WENDELL BUTTERFIELD

work in the Keystone Paper Company and later in the Hamilton Paper Company. In 1915 he entered the employ of the Eastman Kodak Company and had been employed at Kodak Park ever since.

He is survived by his widow, three sons, and three daughters.

James W. Harris

RUMFORD, Me., October 7, 1940—James William Harris, 83, who died September 27 was born in Bennington, Vt., May 22, 1857, the son of John J. and Lititia Harris. He moved with his parents to Wilmington, Del., at an early age. He attended the public schools there and graduated from Rugby Academy at Wilmington. He entered the machine shops of Pussey & Jones Company of Wilmington, manufacturers of paper machinery and ship building.

After serving an apprenticeship at the machinist trade, he decided on papermaking as his life work, and began running a machine in the Augustine Mills of the Jessup & Moore Paper Company of Wilmington, where he remained ten years. He then became connected with A. Seagel of Philadelphia, and rebuilt two tissue mills at Saquolt, N. Y. After selling these mills Mr. Seagel purchased a grist mill at Uhlersville, N. Y., which Mr. Harris converted into a two machine tissue mill.

Leaving there he became connected with the Duncan Paper Company at Mechanicsville, N. Y. After ten years of paper making with this company, he moved to Hamilton, Ohio, as mill manager of the Champion Coated Paper Company. While in Hamilton he supervised the erection of pulp mills for the Champion Fibre Company, Canton, N. C. He made his final move July 1, 1908 associating himself again as mill manager with the Oxford Paper Company, in which capacity he served for twenty-four years. Thoroughly trained in the business, which has made his life work, he arrived at such a degree of knowledge of the various phases of the paper industry, that he is a well recognized authority in such matters and at his retirement was considered one of the best paper makers in the country.

Mr. Harris, in spite of his many duties as mill manager, always found time to be active in Community affairs. A great lover of the out door sports, especially baseball, he was president of the Rumford Baseball Association and a charter member of the Chisholm Ski Club. He spent his leisure time at his summer place at Richardson Lake. He was a life member of the Masonic bodies and a Shriner. He was a member of the executive board of the Rumford Mechanic Institute. Was President of the Oakdale Country Club. He also served for many years as a director of the Oxford Paper Company. He was still a member of the Presbyterian Church of Mechanicsville, N. Y., but attended the Methodist Church in Rumford for over thirty years. He was one of the prime movers in establishing the Rumford Community Hospital, where he served as president of the Board of Trustees until his death. He also was instrumental in obtaining a much needed hotel for Rumford, which bears his name.

Mr. Harris married Hannah L. McCauley of Wilmington, Del., February 24, 1881, who died three years ago.

The funeral services were held at the Methodist Church, Rumford, on Monday afternoon September 30. Interment will be at Riverside Cemetery, Wilmington, Del.

Clare T. Shearer

Clare T. Shearer, 64, widely-known in business circles as the owner of the Shearer Paper Box Company of Cincinnati, Ohio, died October 2 at his home in the Woodford Apartment at Third and Greenup Street in Covington, Ky. His death followed a brief illness.

He was a brother of Capt. Robert Shearer of Orlando, Fla.

Services were held at the Swetnam Funeral Home, in Covington, and interment was in the Highland Cemetery.

He is survived by his widow, Mrs. Mabel Reed Shearer, and three brothers, Capt. Shearer, Harry Shearer of Newport and Emil Shearer, of Covington.

Albert B. Fishwick

Services for Albert B. Fishwick, 2805 Cypress street, Cincinnati, Ohio, paper products dealers who died at Bethesda Hospital on October 1, was held at the residence. Burial was in Spring Grove.

Mr. Fishwick, who was 53 years old, was the mill representative of the Paper Products Manufacturing Company and the owner of the Fishwick Radio Company, 139 West Fourth street.

A native of Cincinnati, he started to work in the

paper business when he was 18 years old. He was a member of the Scottish Rite, Yeaman Lodge 162, and of the Church of the Advent, Kemper Lane.

He is survived by his sister, Mrs. H. G. Robertson.

Oscar Fox

[FROM OUR REGULAR CORRESPONDENT]

FORT WAYNE, Ind., October 7, 1940—Oscar Fox, 56 years old, widely known local business man and director and treasurer of the Hartford City (Ind.) Paper Company, died here recently. Funeral services were held at St. John the Baptist Catholic church, of which he was a member. The widow, two sons and two daughters survive.

MIDWEST MARKET FIRM UNDER FAIR DEMAND

(Continued from page 14)

Burt Hopper of the Hopper Paper Company of Taylorville. Mr. Roach's nomination as a director representing the fourth district has been seconded by business men in Lincoln, Galesburg, Quincy and Canton. He is prominent in paper trade fields and in the work of the National Paper Trade Association and the Paper & Twine Club. If elected, Mr. Roach will serve as a director for a two year period, representing one of the largest and most influential districts of Illinois.

Target Paper Sales Up Sharply

Paper executives visiting the Fall meeting of the National Paper Trade Association learned, among other things, that national defense was booming the sale of target papers. The Peninsular Paper Company of Ypsilanti, Michigan, was widely publicized in the Chicago press because of its report that police departments, schools, clubs and other organizations with rifle ranges had become ready customers. The special paper provided for groups stimulated by national defense measures punctures cleanly so that scores are easy to read, according to the Michigan concern.

New S K F Catalogs

S K F Industries, Inc., Philadelphia, manufacturers of ball and roller bearings, has just released an attractive 36-page catalog entitled "S K F Spherical Roller Bearings".

The first 20 pages of this bulletin are devoted to illustrations of roller bearing applications in mining, crushing, steel, paper, oil, railroad, and allied fields.

The remainder of the book contains helpful information on bearing selection, timesaving computations, and drawings of various types of roller bearing design.

Brown Co. to Move Offices

The Brown Company, with New York offices at 500 Fifth avenue, will move its general offices from Portland, Me., to Berlin, N. H. on December 1, after which date the administrative, finance and accounting departments will be established at Berlin. The sales force connected with the discontinued Portland office will be transferred to the New York office of the company.

New England TAPPI Meets at Pittsfield

The New England Section of the Technical Association of the Pulp and Paper Industry met at the Pittsfield Country Club, Pittsfield, Mass. for its annual golf tournament on Saturday, October 5, 1940. The TAPPI Trophy for low gross was won by Fred W. Schneider of the Hampden Color and Chemical Company. The Superintendents Cup was won by Roy Frisbie of the Westfield River Paper Company. Kickers prizes were won by William Halliday, William Ford, Frank Johnson, A. F. Cosby, J. B. Woodruff, Paul Fowler, Fred Cassidy, John Marrone, Art Bailey, Howard Ferguson and Mrs. A. F. Cosby.

Following dinner two films were shown: "Southern Kraft" and Du Pont's "A New World Through Chemistry". Those present were: A. M. Altieri, P. W. Ayers, Werner Bachli, A. F. Bailey, John Bellows, P. S. Bolton, T. E. Boyne, Arthur M. Brooks, W. J. Burke, Mr. and Mrs. Ralph Carter, Chas. Champion, Mr. and Mrs. A. F. Cosby, Mr. and Mrs. L. W. Crouse, C. C. Decker, R. H. Doughty, Harry Duston, Howard Ferguson, T. J. Flaherty, L. D. Frisbie, Francis M. Gillespie, Mr. and Mrs. Ralph S. Hayden, Dr. and Mrs. R. J. Hemphill, Walter Hendrich, Arthur L. Hobday, P. B. Holden, Mr. and Mrs. Charles I. Horton, Ronald House, F. H. Johnson, Helen U. Kiely, R. E. Kilty, F. S. Klein, A. R. Knaus, D. Knight, Mr. and Mrs. Bob Mannheim, Charles H. Manning, Mr. and Mrs. John C. Marrone, Mr.and Mrs. R. D. McCarron, John M. McGarry, Edw. McQuillan, John McWilliams, H. L. Mellen, Ralph B. Millington, Frank R. Moore, Wm. D. Murray, Mr. and Mrs. J. B. Pendleton, John P. Phelps, William F. Powers, E. O. Reed, E. A. Richardson, Leon L. Riche, W. G. Russell, Mr. and Mrs. Fred W. Schneider, Albert F. Scott, Claude Smith, Mr. and Mrs. Harold Soderbaum, John Studeny, Leonard P. Taylor, Mr. and Mrs. Joseph J. Thomas, L. B. Tucker, Paul E. Tupper, Vincent F. Waters, E. N. Wennberg, Bradford West, Philip Weston, Jr., Carl Wilson, J. B. Woodruff.

Paper Canister Plant Burns

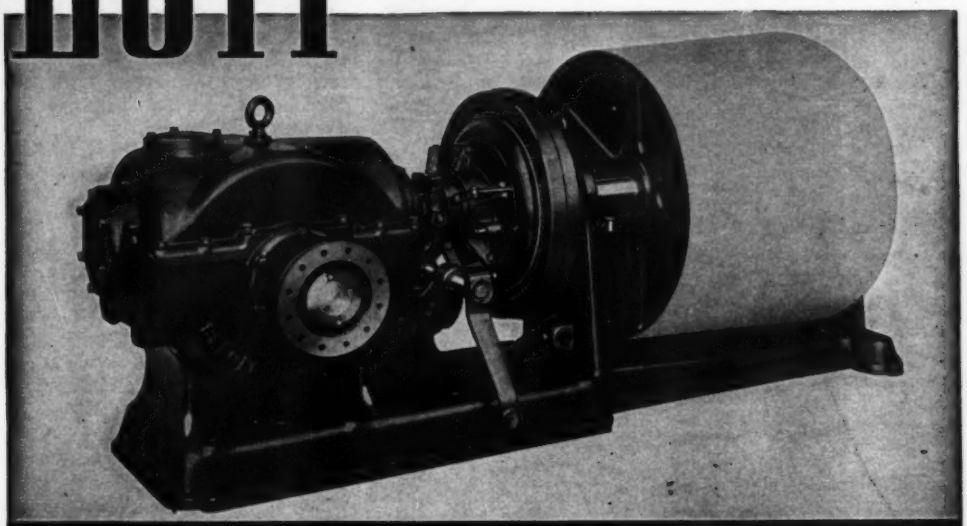
[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., October 7, 1940—The plant of the Paper Canister Company, Fernwood, was destroyed by fire early on Saturday morning last. Officials of the company and the police are of the opinion that the fire was due to sabotage, and several suspects are being held.

The company, a subsidiary of the Seely Tube and Box Company, Newark, N. J., has been making powder containers for the Government. Flames were discovered Saturday morning at 3:30, two hours later the one-story brick and glass building which is a block long, was wrecked.

It was reported that three cans which had contained gasoline had been found near the ruined plant and that FBI agents and State police had been asked to join the investigation. James Churchfield, the plant superintendent, was unable to estimate the damage but said that at least $10,000 in finished goods had been destroyed. Mr. Churchfield said that the company recently obtained a $2,000,000 Government order and had been doing Government work for some time. The containers were for the Picatinny Arsenal, near Dover, N. J.

BELOIT



HEAVY DUTY *Hypoid Gear Drive*

● **Gears cut of special steel are totally enclosed and operate in bath of oil. Gear and pinion shafts are mounted on roller bearings which are automatically lubricated.**

Equipped with improved Beloit automotive type clutch having unusually large air-cooled friction plate area. Oil lubricated throw out collar

BELOIT IRON WORKS PAPER MACH'Y BELOIT WIS.

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BELOIT IRON WORKS, Beloit, Wisconsin, U. S. A.

Warren A. Chilson Joins Sandy Hill

The Sandy Hill Iron and Brass Works announces the appointment of Warren A. Chilson as staff engineer on sales and development work.

Mr. Chilson formerly consulting engineer and assistant sales service manager for the Hooker Electrochemical Company at Niagara Falls brings to Sandy Hill an unusually wide experience. With a chemical engineering education as a background he has worked

WARREN A. CHILSON

up through the ranks in the pulp and paper industry holding positions in operating, technical, engineering and executive departments.

Mr. Chilson will make his home in Hudson Falls, New York, at the headquarters of The Sandy Hill Iron and Brass Works.

Brown Co. Plan Scheduled

The reorganization plan for the Brown Company, having been accepted by the necessary number of bond assents, creditors and stockholders, it will be presented to Federal Judge John A. Peters in Federal Court at Portland, Me., at 10 a. m., Monday, October 21. The date was set after application for a hearing had been filed by Serge Semenenko, chairman of the reorganization managers, William B. Mills, Federal Court clerk, said Friday evening.

Mr. Semenenko announced in Boston Friday that the plan has been accepted by more than two-thirds in amount of the bondholders, by more than two-thirds in amount of the general creditors and by more than a majority of the preferred and common stock of the $40,000,000 New England pulp and paper concern, now operating under Section 77b of the Bankruptcy Act.

In order to assure the reorganization, all bondholders, general creditors and preferred stockholders who have not yet accepted the plan are urged by the reorganization managers to do so promptly, irrespective of the size of their holdings or claims.

"It is important," they said, "that as large a number as possible of such acceptances be given in favor of the plan prior to the date fixed for confirmation."

New General Electric D-C Recorders

The General Electric Type CF line of inkless recorders has been extended to include direct-current instruments (Type CF2) available as voltmeters, ammeters, millivoltmeters, milliammeters, and even microammeters in ratings down to 125 microamperes full scale. These new CF2 instruments make it economical to apply recording instruments to many applications where previously the expense of suitable equipment could not be justified. Because of their inkless operation, they are ideal for general testing purposes and for use on moving vehicles — such as trains, trucks, and buses — for studying generator performance, battery load, and speed.

The CF2 recorder is portable, may be wall or pole mounted, and is suitable for indoor or outdoor application. Providing continuous operation for 30 days without attention, it is ideal for installation where frequent servicing is impractical. It may be operated at temperatures ranging from —10 F to 120 F.

The electric element of the CF2 is a concentric magnet d-c element, thoroughly shielded from stray magnetic fields. It is powered by a Telechron motor. The electric element, as well as all other moving parts, is housed in a modern, weatherproof case of aluminum-alloy casting. Accuracy is within 2 per cent of full-scale value.

Dinner Club to Open October 15

The New York N.A.W.M.D. Dinner Club, reinforced by a large contingent of Philadelphia members, is planning to open the fall season of the club with a rather unique dinner at the Hotel Astor, New York, on the evening of Tuesday, October 15.

For the opening dinner all formality is to be dispensed with. The hotel is going to fit up one of its most attractive rooms as a club and members of the association and their friends who attend will, we believe, vote this initial fall dinner, one of the most enjoyable trade association functions yet held in New York.

The affair will be similar in many respects to the type of dinner or party that members would be likely to give in their own club and one of the added attractions may be a couple of hours of bridge with a fine prize for the winner.

Members of the trade desiring to attend this affair should contact the offices of the National Association of Waste Material Dealers, 1109 Times Building, New York, (Telephone BRyant 9-1318) for Tickets and further details.

Container Corp. Makes Promotions

[FROM OUR REGULAR CORRESPONDENT]

ANDERSON, Ind., Oct. 7, 1940—Promotion of two officials of the Container Corporation of America here has been announced by I. C. Keller, vice president. G. Brook Sefton of this city has been named general manager of the Anderson division, in charge of sales and manufacturing. Ralph Young of this city has been named general manager of the straw division, in charge of sales and manufacturing at plants in Carthage, Ind., and Circleville, Ohio. He will have offices at Carthage.

40-Hour Workweek Does Not Begin Until October 23

Employers whose regular workweek starts before midnight on Wednesday, October 23, 1940, during that week need conform only to the 42—not the 40-hour workweek, it was announced today by Colonel Philip B. Fleming, Administrator of the Wage and Hour Division of the United States Department of Labor.

"It is our opinion that the 40-hour week will apply for the first time to the first *full workweek* beginning on or after midnight, October 23, 1940," Colonel Fleming said. "This is in accordance with the language of the Act which declares that employees shall not be worked 'for a workweek longer than 40 hours after the expiration of the second year from the effective date of the Act.' If the employee's work begins, for example, on Monday, October 21, 1940, the employer need pay time and a half only if more than 42 hours are worked in the period of seven consecutive days from Monday, October 21, through Sunday, October 27, inclusive."

If the employee's workweek begins on or after midnight, October 23, Colonel Fleming explained, the employer must pay time and a half after 40 hours are worked in the workweek beginning at such time. For employers whose regular workweek begins on Monday, Tuesday, or Wednesday, the 40-hour provision will not become effective until Monday, October 28, Tuesday, October 29, or Wednesday, October 30, respectively.

Colonel Fleming said, the present statutory minimum wage rate of 30 cents an hour remains unchanged. This does not apply in cases where industry committees have recommended minimum wages higher than the statutory requirement of 30 cents per hour which became effective on October 24, 1939. Minimums higher than 30 cents have become effective through wage orders issued by the Administrator among others in the Pulp and Primary Paper Industries. Minimum wage rates established by wage orders based on recommendations of industry committees in those industries range from 32½ cents to 40 cents per hour.

The Fair Labor Standards Act, which became effective on October 24, 1938, provided that for the first year of its operation employees should receive a minimum wage of 25 cents per hour, with overtime at the rate of time and a half the regular wage rate, whatever that might be, for all hours in excess of 44 worked in any workweek. For the second year, which expires on midnight October 23, the Act provided that the minimum wage should be 30 cents per hour, with overtime at the rate of time and a half after 42 hours. Beginning on October 24, the maximum workweek without overtime is established at 40 hours, but the statutory minimum wage does not increase until October 24, 1945, when it must be a minimum of 40 cents per hour.

H. W. Lockhart Recovers from Accident

Boston, Mass., October 7, 1940—Hubert W. Lockhart, head of the Von Olker-Snell Paper Company, is recovering from injuries sustained some months ago by being thrown from a horse. He is able to come to his office a few hours each day.

No. 3½ BT Anti-Friction, Worm-on-Top Gear Speed Reducer

Winfield H. Smith, Inc., pioneer speed reducer manufacturers located in Springville, Erie County, N. Y., have recently announced another new model in their comprehensive line of speed reducers. This new number, 3½BT, is designed for continuous duty installations and represents the finest construction in the fractional horse power field.

The worm is of hardened steel with ground threads and is located on top. It is keyed to the shaft which is mounted on Radial-Thrust type ball bearings. The

New Model Speed Reducer

gear is of a special alloy bearing bronze in which only virgin metal is used. Oil seals are of the built-in type and are provided at all shaft extensions. They are designed to keep oil in and dirt out.

The 3½BT model is rated for ¼ hp. with torque capacity of 140 to 190 inch pounds. Ratios are as follows—58, 36, 18 and 9 to 1. This reducer weighs 15 lbs. is 6½ inches high and the base measures 4⅛ wide x 5 inches long.

New Sales Promotional Program

On October 4, The National Paper Trade Association inaugurated a new sales promotional program open to the participation of the membership. Appropriately at this particular time, it is entitled, "Get Out The Votes." It provides the basis and mechanics for a merchant to operate a sales contest in his own organization, and offers awards to the salesmen contributing the best answers to merchandising questions circulated to them in weekly mailings for a period of eight weeks. In addition, the Association will also distribute 25 grand prizes at the close of the contest. Paper Trade Journal will announce the winners of these awards as soon as they are given out by the association, thus giving individual recognition in addition to the awards received.

This is the first attempt of the National Paper Trade Association to furnish its members with this type of merchandising program and it is believed that considerable enthusiasm will be created and efforts stimulated which will lead to increased sales.

The weekly mailings which these salesmen will receive will be educational both from the viewpoint of working efficiency and successful methods and also provide new and usable information as to merchandise lines. Where justified by results, the plan provides a basis for continued operation.

CONSTRUCTION NEWS

St. Regis Falls, N. Y.—The St. Regis Paper Company, 230 Park avenue, New York, N. Y., manufacturer of writing and other paper stocks, has approved plans for new addition to mill in vicinity of St. Regis Falls, to be two-story, about 54 x 75 feet, reported to cost close to $50,000, with equipment. Contract for erection has been awarded to Rouse & Hallenback, 437 Maple street, Syracuse, N. Y., and work is scheduled to begin at once. Frederick S. Webster, 1412 Madison street, Syracuse, is architect.

Wisconsin Rapids, Wis. — The Consolidated Water Power and Paper Company, manufacturer of book, writing and other paper stocks, has completed plans for new addition to mill for expansion in finishing department. It will be three-story, 48 x 260 feet, estimated to cost over $125,000, with equipment. Erection will be placed under way at once, with completion scheduled early in January. Thomas Utegaard is company engineer. Company has superstructure in progress for new steam power house at mill, as recently noted in these columns, and is making award for roofing, steel sash and other structural work; main erection is being carried out by day labor. New unit will be 40 x 40 feet, and equivalent to four stories in height. It is reported to cost over $70,000, with boilers and other equipment.

Martinsville, Va.—E. I. duPont deNemours & Co., Inc., duPont Building, Wilmington, Del., Rayon Division, is concluding arrangements for purchase of tract of about 485 acres of land about two miles from Martinsville, fronting on Smiths River, as site for new mill for production of its rayon materials, known as Nylon. Plant will comprise several large one and multi-story buildings for chemical, processing and general manufacturing divisions; storage and distributing units, power house, pumping station, machine shop and miscellaneous structures. Entire project is reported to cost over $10,000,000, with machinery. Norfolk & Western Railway will build a spur tract to plant site, connecting with main line in that district. Mill construction is planned at early date. Company engineering department is in charge.

Lufkin, Tex.—The Southland Paper Mills, Inc., manufacturer of newsprint, has awarded general erection contract to Merritt-Chapman & Scott Corporation, 17 Battery place, New York, N. Y., for new addition to mill, previously referred to in these columns, consisting of several one and multi-story units for large increased capacity. Work will be placed under way soon. Entire project is reported to cost close to $5,000,000, including equipment. George F. Hardy, 305 Broadway, New York, is consulting engineer.

New Brunswick, N. J. — Johnson & Johnson, George street, has approved plans for one-story addition to plant, to be equipped for production of industrial tape. It will be 205 x 230 feet, reported to cost over $100,000, including equipment. Contract for erection has been awarded to the Rule Construction and Repair Company, 383 George street, New Brunswick, and work will begin at early date.

Buffalo, N. Y.—National Gypsum Company, 190 Delaware avenue, Buffalo, manufacturer of wall board, insulating board and kindred products, has begun a modernization and improvement program at four of its wall board mills in the Eastern district, to include installation of additional production facilities. Entire project is reported to cost about $400,000, with equipment. Completion is scheduled by close of the year.

Menasha, Wis.—The U. S. Paper Supply Company, 59 East Van Buren street, Chicago, Ill., waste paper products, has awarded general contract to Fred Piette & Son, 1108 North Oneida street, Appleton, Wis., for two additions to branch storage and distributing plant on Appleton street, Menasha, operated by the Menasha Mill Supply Company, recently referred to in these columns. The structures will be two-story and basement, 40 x 80 feet, and one-story, 48 x 80 feet, reported to cost close to $40,000, with equipment. Erection will be placed under way soon.

East Alton, Ill.—The Cellulose Research Corporation, East Alton, is considering the construction of a new mill in the South and will make an investigation of a number of districts for suitable site. Project is a tentative stage. No estimates of cost have been announced.

Meadville, Pa.—The American Viscose Corporation, Delaware Trust Building, Wilmington, Del., manufacturer of viscose rayon products, has awarded general contract to the George A. Rutherford Company, 2725 Prospect avenue, Cleveland, Ohio, for construction of one-story addition to branch mill in Vernon Township, near Meadville, to be equipped for new research laboratory. Cost is reported close to $50,000, with equipment. Work is scheduled to begin at once. The Ballinger Company, 105 South Twelfth street, Philadelphia, Pa., is architect and engineer.

Miami, Fla.—The Brenner Box and Printing Company, Miami, has construction nearing completion on new one-story plant for the manufacture of paper boxes and containers, and will have structure ready for equipment installation at early date. As previously noted in these columns, it will be 80 x 255 feet, reported to cost close to $65,000, with equipment. M. R. Harrison Construction Corporation, 1605 Biscayne boulevard, Miami, is general contractor. L. B. Taylor, Congress Building, Miami, is consulting engineer.

Montreal, Que.—The Premier Paper Box Company, Ltd., 7 River street, Verdun district, manufacturer of paper boxes and containers, has approved plans for new plant on Mile End street, consisting of a one-story structure, 70 x 300 feet, to be equipped for large capacity. Erection will be placed under way at early date. Cost reported close to $100,000, with equipment.

New Companies, Etc.

New York, N. Y.—The Driggs Paper Products Corporation has been organized with capital of $20,000, to manufacture and deal in paper goods of various kinds. New company is represented by B. Robbins, 25 Warren street, New York, stationery products.

Boston, Mass.—The B. & B. Corrugated Box Company, 19 Portland street, has filed notice of company organization to manufacture and deal in

corrugated boxes and containers. Leonard J. Beckwith, 20 Orient avenue, Newton Center, Mass., is head.

Boston, Mass.—The Congress Cellophane Products Company, 273 Congress street, has filed notice of organization to deal in cellophane products. William Sharpe, 5 Richard terrace, Dorchester, Boston, is head.

New York, N. Y.—The White Mountain Paper Company, 111 Broadway. a Delaware corporation, has filed notice of change in company name to Weycraft Paper Corporation.

New York, N. Y.—The Central-Pickup Envelope Company has been incorporated with capital of 100 shares of stock, no par value, to manufacture and deal in commercial envelopes and kindred products. New Company is represented by Isidore Paley, 170 Broadway, New York, attorney.

Boston, Mass.—The Banner Paper Company, 88 Broad street, has filed notice of company organization to deal in paper products of various kinds. Philip Comeau, 28 Haslet street, Roslindale, Boston, is one of heads of company.

New Literature

Outdoor oil circuit breakers, are described in Catalogue 3639, issued by the Roller-Smith Company, Bethlehem, Pa. These circuit breakers, class 50-OC-75, feature inverted A-frames, replaceable transformers without disturbing contact alignment, terminal bushings relieved of closing shocks, horizontal surfaces at ground potential, piston and cylinder shock absorber to prevent rebounding of contacts and magnetic blowout and arching horns to minimize arching. Construction, housing and full operating details are given.

Application of small motors, is the subject of selecting guide folder, F-8525, issued by the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa. It supplies a full size application table, covering every fractional horsepower A.C. and D.C. or universal motor, with speed and torque data, wiring diagram and other essential factors, with instructions and suggestions on selecting motors for various jobs.

V-Belt data book, issued by The B. F. Goodrich Company, Akron, Ohio., contains 170 pages and gives listings of belt requirements for various types of machines. Many pages are devoted to numerical group listings of belt sizes and a list of belt dimensions for V and flat belts.

"How to cut your timber for pulpwood," is the title of a folder issued by the Southern Pulpwood Conservation Association, 1501 First National Bank Building, Atlanta, Ga. It was prepared to familiarize the average landowner with the proper methods of cutting his timber for pulpwood.

Roller chains are described in detail in Bulletin R-40, issued by the Morse Chain Company, Division of Borg-Warner Corporation, Ithaca, N. Y. It contains 92 pages and contains complete information on the construction, adaption and application of Morse roller chains, performance data and specifications of regular and special types of sprockets. A complete price list of chains and sprockets is included.

Friction clutches are described in a catalogue issued by The Carlyle Johnson Machine Company, Manchester, Conn. It contains data on the Johnson standard and Super-Johnson type of expanding ring friction clutches. A separate dimensioned bulletin, Series No. 1, covers the company's new "Maxitorq" multiple disc type of clutch in three sizes.

Transmission belting is covered in a four-page catalogue section, No. 2100, issued by The B. F. Goodrich Company, Akron, Ohio. It gives concise information on the company's Highflex brand of transmission belting, with description of the processes of manufacture, testing of materials and details in the fabrication of this square-edge, foldess belting.

Caustic soda is the subject of a 56-page technical booklet issued by the Michigan Alkali Company, 60 East 42nd street, New York. The booklet is printed on paper coated with the company's Wyandotte calcium carbonate. It contains a history of the company, the manufacture of caustic soda, pH of alkalies, and much information of interest to those engaged in the technical division of the industry.

Laboratory equipment is described in a bulletin issued by the Valley Iron Works, Appleton, Wis. The equipment described includes the company's 1½ and 5-pound Niagara and Holland experimental beaters, washer cylinder equipment, couch rolls and plates, a laboratory jordan and screen, size and clay testers, semi-commercial equipment and instructions for installation, operation and maintenance of Valley laboratory equipment.

Angleflow pumps are described in Bulletin 5710, issued by Fairbanks Morse & Company, 600 South Michigan avenue, Chicago, Ill. This is a new line of pumps, in both vertical and horizontal types. It includes construction details, dimensions and typical specifications of particular interest to engineers engaged in large capacity pumping operations.

Paper Bought Under Walsh-Healey Act

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 9, 1940—During the week ended September 21, the Government purchased $210,550.80 worth of paper and allied products under the Walsh-Healey Act as follows: $37,322.22 worth of memorandum pads, manifold paper for the Navy Department from Marquette Paper Company, Chicago, Ill.; $12,340.94 worth of cards, paper, tape for the Navy Department from L. Hyman & Sons, New York; $53,196.84 worth of paper for the Navy Department from R. P. Andrews Paper Company, Washington, D. C.; $12,700.80 worth of drinking cups for Tennessee Valley Authority from Dixie-Vortex Company, Chicago, Ill.; $79,800.00 worth toilet paper for Navy Department from Bogart Paper Company, New York; and $15,190.00 worth of lens paper for Navy Supply Depot from R. P. Andrews Paper Company, Washington, D. C.

Football Schedules on Woodcraft

The Manvellum Company, manufacturers of distinctive papers, Holyoke, Mass., has just released a football schedule printed on its Woodcraft cover which is more than usually interesting and attractive. Woodcraft distributors in the East and Middle West have been furnished with a schedule covering football games in their particular territory, while the company's distributors on the Pacific Coast and in the Southwest have been furnished with different schedules covering the Far Western and Southwestern teams.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending October 9, 1940

	High	Low	Last
A. P. W.	2⅛	2⅛	2⅛
Armstrong Cork Co.	35⅞	35¼	35¼
Celotex Corp.	7⅞	7	7
Celotex Corp., pf.	62	60⅛	60⅛
Certain-Teed Products Corp.	5⅜	4¾	4¾
Certain-Teed Products Corp., pf.	32	29	29½
Champion Paper & Fibre Co.	22	21	21
Champion Paper & Fibre Co., pf.	102	102	102
Congoleum-Nairn Co.	18⅜	17⅝	17¾
Container Corp. of America	15⅛	14½	14½
Continental-Diamond Fibre Co.	6⅝	6½	6½
Crown-Zellerbach Co.	15⅝	15	15
Crown-Zellerbach Co., pf.	87¼	87	87
Flintkote Co.	18⅛	16⅝	16⅞
Robert Gair	3¼	2¾	2¾
Robert Gair, pf.	17½	16¾	16¾
International Paper & Power	15¼	13¾	13¾
International Paper & Power, pf.	61	57¾	58⅛
Johns-Manville Corp.	71½	68¼	68¼
Johns-Manville Corp., pf.	125¾	125½	125½
Kimberly Clark Corp.	35	34	34
MacAndrews & Forbes	29	29	29
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	30	28¾	28¾
Mead Corp.	9⅛	8⅞	8⅞
Mead Corp., pf.	68	68	68
Paraffine Companies, Inc.	....	....	....
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	18	16¼	16⅜
Rayonier, Inc., pf.	30½	28¼	28¼
Ruberoid Co.	17	16⅜	16⅜
Scott Paper Co.	41⅝	41¼	41¾
Scott Paper Co., pf.	110¼	110	110
Sutherland Paper Co.	24¼	24¼	24¼
Union Bag & Paper Corp.	12¾	11⅜	11⅜
United Paperboard Co.	3¼	3⅜	3⅜
U. S. Gypsum Co.	81	75¾	76½
U. S. Gypsum Co., pf.	178	178	178

New York Curb Exchange

High, Low and Last for Week Ending October 9, 1940

	High	Low	Last
American Box Board Co.	5	5	5
Brown Co., pf.	23½	21	22½
Great Northern Paper	41	40	41
National Container Corp.	11	10½	10½
St. Regis Paper Co.	2⅞	2⅝	2¾
St. Regis Paper Co., pf.	72	70	70
Taggart Corp.	3½	3⅜	3½

Rolland Declares Dividend

MONTREAL, Que., October 7, 1940—The Rolland Paper Company, of Montreal, has declared a dividend of 30 cents per share on common, payable November 15, to shareholders of record November 5, ex-dividend November 3. This represents an increase of 15 cents per share over the last payment made on August 15 last and will bring total distribution for the year to 75 cents. In 1939, 60 cents was paid on the common, in 1938 and 1937 $1.00 and in 1936, 50 cents.

The regular dividend of 1½ per cent on preferred was also declared, payable December 2, to shareholders of record November 15, ex-dividend November 14.

Hummel-Ross Profits Up

The Hummel-Ross Fibre Corporation for the thirty-six weeks to September 7, reports a net profit of $552,951, after charges and Federal and State income taxes, but before any provision for excess-profits taxes, equal, after dividend requirements on the 6 per cent preferred stock, to $1.34 each on 391,706 shares of common stock. This compares with $65,413, or 10 cents each on 389,611 shares of common stock for the thirty-six weeks to September 7, 1939. Net sales amounted to $2,586,728, against $1,603,871.

Brown Co. Nets $2,868,450

The Brown Company and its subsidiaries had a net income of $2,868,450 for the forty weeks ended on Sept. 7, according to a report issued on October 3 by Serge Semenenko, chairman of the reorganization managers. The income, which was after Canadian income taxes and adjustment for foreign exchange but before depreciation, depletion and deferred interest, contrasted with a deficit of $388,100 for the corresponding period last year. The concern makes pulp and paper.

After deducting depreciation and depletion of $1,390,117, which compared with $1,349,571 in the 1939 period, the net income before deferred interest on bonds amounted to $1,478,333, against a loss of $1,737,671 last year. Net sales for the forty weeks this year aggregated $19,232,878, against $11,993,503 the year before.

Net income for the four weeks ended on Sept. 7 was $217,970 before deferred interest charges, contrasted with a loss of $206,403 on same basis for the corresponding period of 1939. Net sales were $1,761,403, against $1,164,367.

Howard Smith Lists Shares

MONTREAL, Que., October 7, 1940—The Howard Smith Mills, Limited, have just listed an additional 8,097 shares of 6 per cent preferred stock of $100 par value on the Montreal Stock Exchange. This will make the total number of preferred shares listed 71,713. In addition, there are listed on the exchange, 332,836 common shares. The additional preference shares are to be issued in exchange for 8,097 6 per cent preferred shares of Alliance Paper Mills, Limited.

To Pay Interest on Bonds

Payment of interest due May 1, 1939, to November 1, 1940, on first mortgage 6 per cent bonds of British Columbia Pulp and Paper Company, Ltd., will be made on November 1, 1940, at the 6 per cent rate, it was announced. Postponement of the payment to November 1, 1942, had been authorized by bondholders last year.

National Gypsum Stock Listed

The New York Stock Exchange has authorized for listing 300 additional shares of National Gypsum Company $4.50 convertible cumulative preferred stock on official notice of issuance as part consideration for certain of the assets of the Windsor Paper Mills, Inc.

Bartgis Bros. Net $44,334

Bartgis Bros. for the six months ended June 30, report a net income of $44,334, or 36 cents a common share; for same 1939 period, net income $44,180, or 36 cents a share.

Indianapolis Busier

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., October 7, 1940—A more definite trend toward better business was evident in the paper field in Central Indiana last week. Demand for most lines continued good and in many instances the volume of inquiries had increased.

One of the bright spots during the week was a decided increase in sales of wrapping paper and bags to the retail trade. This is considered to be very encouraging, following a lull during the summer. Much of this is due directly to increased business by retailers, caused by continuing increases in employment rolls.

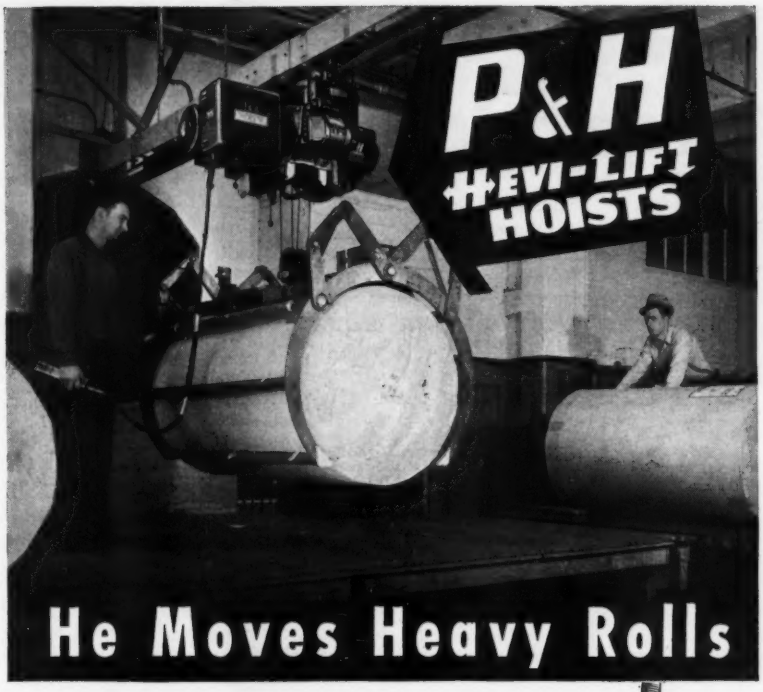
Box factories continue to work steadily and report a firm underground current. Christmas orders are being received in large quantities and the regular business is holding its own. Demand from the hardware and automobile accessory trade has been particularly good since the coming of cooler weather. The purely gift box trade this year is expected to be higher than last.

Building papers and roofing continue to move regularly, though the volume has slowed down slightly with the coming of fall. However, the trade expects an active business until severe weather halts outside work. Retailers' stocks are not large, but apparently are well balanced and buying is almost entirely for current needs.

Demand for fine paper continues steady. Ledgers, books and bonds are moving well and many of the larger printers report considerable work booked and in prospect. Prices are being firmly held.

Newsprint and groundwood papers had a fair week. Much of the steadiness in the newsprint demand is due to good business being done by the smaller papers throughout the state. The metropolitan dailies show about the same lineage as for the last month, with just a bare increase due to fall advertising.

Waste paper continues to show firmness with a good demand from the mills. The rag market is steady with only a fair demand.



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Graphic Arts Institute To Hold Exhibit

BOSTON, Mass., October 7, 1940—The Graphic Arts Institute is to sponsor an exhibit of New England printing Friday and Saturday, November 22 and 23 at the Hotel Statler in connection with the 500th anniversary of printing in America.

Simplified Practice for Food Containers

The Division of Simplified Practice of the National Bureau of Standards has announced that Simplified Practice Recommendation R175-40, Heavy-Duty, Round, Nesting, Paper, Food and Beverage Containers and Lids, is now available in printed form. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for five cents each.

This simplified list of recommended containers includes standard types, shapes, capacities, weight per 1000 containers (waxed and unwaxed), maximum depth of lid seat, maximum bottom recess. Standard basis weight of paper for different types of lids is also given.

PAPER TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR
Vol. 111 October 10, 1940 No. 15

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

NATIONAL SAFETY COUNCIL, PAPER AND PULP SECTION, Annual Meeting, Stevens Hotel, Chicago, Ill. October 7-11.

ECONOMIC INFLUENCES

It has become increasingly difficult during the last few months to consider economic and broad business problems and conditions without also including the increasingly important influence of the European conflict upon American economy. This outside influence is much closer to us and exerts a greater effect upon the changing fortunes of business opportunities than many business men seem aware of, although the influence of the conflict and the revolutionary changes made and now in progress in Europe is apparent to nearly everyone in its profound effect upon current American thought.

Economic influences are thus reflected in various ways. The nature and extent of the economic effects of conscription, now termed selective service, are of widespread interest. To train men adequately for military service requires military equipment of every type. To defray the expenses of the first year's training program, President Roosevelt has asked for an additional appropriation of $1,600,000,000. This is the estimated outlay for merely the initial year. The national defense program is a costly and complex undertaking. As it will be distributed over a period of years, many difficult adjustments of the national economy including, of course, industry, must be made. A new law authorizes limited commandeering of industrial plants. Much higher taxes must be levied. Sacrifices must be made. The former and prevailing status of the national economy must obviously alter in the future.

Within the past few years nations with a democratic form of government have declined and severe restrictions have been imposed upon their economies. In the last few years the peace-time authority of President Roosevelt has increased until the President now can exercise more power than President Wilson possessed during the years of 1917 and 1918. The grants of authority the President may now exercise at his discretion are so broad that few individuals or business enterprises would lie outside of it. He can call into military service any resident between the ages of 21 and 35 years; he can force an industrial plant to accept a defense contract and compel it to complete that order before other orders are filled; he can seize and operate the factory if the management declines to accept the Government's terms. The President can also divert the shipment of raw materials from a manufacturer without a defense contract to a manufacturer with a contract. He can specify what exporters may sell and where they can sell it, or prevent them from selling any goods outside this country. He can negotiate contracts without calling for competitive bids; he can build factories with government funds, to operate as government enterprises, or lease them to private managers; he can loan business men money to expand plants and he can train workers to operate the plants. All these things have been given to the President by authority of Congress. This grant of power is, of course, more extensive than has ever been given to any President of the United States. It may be assumed that Congress believed this extension of the Chief Executive's power was essential to promptly meet any contingencies that may arise, which may or may not mean that circumstances will require the President to use his authority in full.

In discussing several fundamental aspects of the status of national economy, Alfred P. Sloan, Jr., chairman of the General Motors Corporation, in an address at the tenth anniversary of the Maurice and Laura Falk Foundation at Pittsburgh, pointed out some of the difficulties which industry had to meet in growing political barriers, saying in part: "In recent years, the American economy has been confronted with a number of destructive forces and other deterrents never before experienced. The decade of the 'thirties' was a period of apprehension and industrial stagnation and retardation. How it may have been induced is a highly argumentative question. But there can be no uncertainty as to its having been prolonged and intensified by economic panaceas and political intolerance. Now comes the decade of the 'forties'. This might well be a period of renewed opportunity for the resumption of industrial progress along sound and fundamental lines unless overshadowed by continued political interference with our essential economic processes. From 1790 to 1930 American industrial life and living standards advanced continuously. Our democratic traditions gave equality of opportunity and equality of responsibility . . . . The outstanding success of American enterprise is the result."

In asserting that our industrial population earned

more in purchasing power and enjoyed a higher standard of living than any other similar group anywhere Mr. Sloan said that was because the economy was free. "The volume of industrial production in each new business cycle exceeded that of the previous cycle", he continued, "America was always moving ahead. But now! National income payments have not equalled in any succeeding year the record of 1929. The population is greater, yet national income is less. Millions remain unemployed, year after year. America is falling behind. Why is this so? Evidently something has changed! In economic policy we have passed from a nation which has risen to the highest peaks of prosperity ever known based upon the philosophy of a constantly expanding volume of wealth, to one more primarily concerned with the doctrine of taking from some and giving it to others . . . With a broader distribution, no one can quarrel. It is economically and socially desirable. But it is difficult to understand how we can provide more people with more things in more places . . . by policies that very definitely limit the total amount to be distributed to all . . . Let me repeat, we can not improve the status of those who have the least, by law. Higher wage rates can be sustained only by increased productivity . . . Thus it will be seen that the five year period just ahead is certain to be a most critical one. It will be a period of readjustment in which the economy will be subjected to the strain of the most power and contradictory forces . . . The economy must be reconstructed on a firm foundation of economic law with a full understanding of the existing realities . . . And in a sound and virile economy lies the fundamental key to the nation's security. It must be patriotic. It can not succeed as a partisan effort. The consequences are far too great. And further, it must not fail."

Defense Committee Organized

The Defense Committee of the Paper and Pulp Industry has now been completely organized with the following membership: Chairman—R. A. Hayward, Kalamazoo Vegetable Parchment Company, Parchment, Kalamazoo, Mich.; W. J. Alford, Jr., Continental Paper Company, Ridgefield Park, N. J.; R. J. Cullen, International Paper Company, New York, N. Y.; H. A. Legge, Howard Paper Company, Urbana, Ohio; C. B. Morgan, Rayonier, Inc., New York, N. Y.; F. J. Sensenbrenner, Kimberly-Clark Corporation, Neenah, Wis.; Geo. R. Wallace, Fitchburg Paper Company, Fitchburg, Mass.; J. L. Riegel, Riegel Paper Corp. (President, American Paper and Pulp Association), New York, N. Y.—ex officio.

In announcing the committee, E. W. Tinker, secretary of the American Paper and Pulp Association, states: "It is believed that the membership of this committee gives fair representation to all phases of the industry and it is hoped that the committee may serve a very useful purpose not only in maintaining contact with the Advisory Commission to the Council of National Defense, but also as a clearing-house for problems that arise within the industry."

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1940	1939	1938	1937	1936	1935	1934
January	90.2%	77.5%	63.9%	90.3%	76.1%	65.8%	.....
February	86.2%	81.7%	68.7%	90.1%	77.9%	70.0%	.....
March	83.9%	84.0%	69.6%	90.3%	76.0%	70.5%	.....
April	86.3%	82.9%	68.3%	92.1%	82.3%	70.0%	.....
May	91.7%	80.2%	69.0%	90.6%	81.6%	69.4%	.....
June	93.8%	79.7%	66.0%	87.3%	80.7%	72.3%	.....
July	87.1%	75.2%	72.0%	81.8%	77.3%	64.9%	.....
August	87.3%	82.9%	77.2%	82.9%	81.5%	70.9%	.....
September	82.6%	88.7%	76.3%	78.6%	80.5%	71.9%	58.2%
October	.....	96.6%	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	97.2%	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	91.1%	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average	.....	84.9%	72.3%	80.6%	81.3%	70.5%	.....
First 39 weeks	87.9%	81.5%	70.1%	86.9%	79.4%	69.4%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1940		CORRESPONDING WEEKS, 1939	
August 24	86.8%	August 26	83.3%
August 31	85.7%	September 2	85.0%
Sept. 7 (Holiday Week)	71.0%	September 9	74.0%
September 14	84.1%	September 16	91.8%
September 21	87.2%	September 23	93.4%
*September 28	89.2%	September 30	95.7%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting—Current Weeks					
Ratio Limits	Aug. 24, 1940	Aug. 31, 1940	Sept. 7, 1940	Sept. 14, 1940	Sept. 21, 1940	Sept. 28, 1940
0% to 50%	55	53	82	52	45	33
51% to 100%	242	243	212	240	231	199
Total Mills Reporting	297	296	294	292	276	232

PAPERBOARD OPERATING RATIOS

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	63%
1940	71%	70%	69%	70%	76%	79%	72%

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%
1939	72%	74%	84%	81%	71%	70%
1940	74%	72%	....	....	....	....

Week end. Aug. 24, 1940—74%
Week end. Aug. 31, 1940—74%
Week end. Sept. 7, 1940—60%
Week end. Sept. 14, 1940—76%
Week end. Sept. 21, 1940—74%
Week end. Sept. 28, 1940—78%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

* Preliminary figure.

Price of Pulp in Cartel Agreement

WASHINGTON, D. C., October 9, 1940—Price of wood pulp to each market in the European cartel agreement on wood pulp will be determined by a system of voting based upon past exports to the market concerned, according to a report from the office of the American Commercial Attache, Stockholm. The number of votes to which each exporting country is entitled will be decided on for each type of pulp, for each market, based on the tonnage of exports to that particular market.

On the basis of exports to the United States from 1929 to 1939, it is estimated that Sweden will have approximately the following percentage of votes on the following types of pulp: unbleached sulphite, 64%; bleached sulphite 31%; unbleached sulphate, 80%; bleached sulphate, 84%; Germany, Norway and all others except Finland hold 54% of the votes on bleached sulphite.

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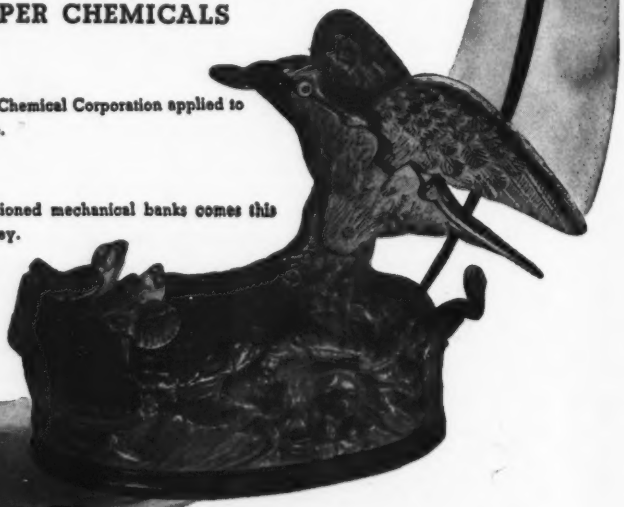

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Bacteriological Examination of Paper and Paperboard

TAPPI Suggested Method T 449 sm-40

I. Scope

The following testing procedures are suggested, from the consensus of experienced bacteriologists, for the bacteriological examination of paper and paperboard. While the consumers' interest is confined to testing the finished product, it is recognized that during manufacture the tests would also be applied to such materials as pulp (both wet and dry), slush stock, and water. The procedures therefore include whatever additional instructions are necessary for these materials. The procedures outlined represent in every case what may be considered at this time as minimum standard practice.

Because of the exacting technique required in bacteriological procedures, they can be expected to yield reproducible results only in the hands of properly trained technicians. Likewise, more than usual care must be exercised in the collection and shipment of samples. If possible, this work should be done by a bacteriologist.

II. Apparatus and Equipment

The following apparatus may be obtained from the usual laboratory supply houses, except in those cases where specific sources of supply are mentioned.

1. *Balance.* This should be equipped with a platform of a size to readily accommodate the Petrie dishes used. It should be sensitive to 0.1 gram.

2. *Colony Counter.* Any one of several types may be used. The Quebec, the Buck, and the Wolffhuegel colony counters have been found satisfactory. A hand tally for recording the count is recommended.

3. *Containers for Dry Samples.* Two single envelopes, one placed inside the other, are used. The larger one may be 9 by 12 inches and the smaller 6.5 by 9.5 inches. They should be made of heavy kraft paper, tested for ability to withstand breakdown due to embrittlement or charring during sterilization in the hot-air oven. After sterilization, the flap on the outer envelope is secured by Scotch tape.

Another procedure is to place a number of single envelopes in a still larger envelope and to withdraw them as needed after sterilization. A third procedure is to make a suitably sized folder of heavy kraft paper and to sterilize it in the autoclave or oven. After the paper sample has been placed inside the sterile folder, the latter is sealed with Scotch tape.

4. *Cotton.* Rolls of nonabsorbent cotton are used for making plugs; or, if desired, ready-made plugs may be employed.

5. *Disintegrator.* Several types are available. The choice depends largely upon the needs of the individual laboratory.

(a) *Electrical Disintegrator.* These are either the so-called soda fountain mixers or modifications of the same. The Stevens mixer [1] has been found to be suited for paper disintegration. Another electrical type is the Bersted disintegrator.[2]

(b) Any other type of disintegrator may be used, provided it satisfies the following conditions: (1) the paper sample is completely disintegrated within a short period of time—e.g., 6 to 10 minutes; (2) aseptic technique is fully maintained during the handling and the disintegration of the sample, as discussed under VI Preparation of Sample.

6. *Flaming Equipment.* Depending upon the circumstances, an alcohol lamp, a gasoline blowtorch or a Bunsen burner may be used to flame forceps, scissors, knives, mouths of sterile containers, etc.

7. *Flasks.* 200-cc. Erlenmeyer flasks may be used as containers for sterile media.

8. *Forceps.* These are necessary for handling samples of paper and wet pulp. Each pair is placed in a separate kraft envelope made especially for this purpose, and is then sealed with gummed tape. The unit is then ready to be sterilized. An alternative procedure is to sterilize the forceps by flaming, in which case the envelope is unnecessary.

9. *Incubator.* A reliable incubator which will maintain a temperature of 37.0 ± 0.5 deg. C. is necessary to provide proper incubation conditions for the inoculated plates and tubes.

10. *Knives.* A paring knife with its blade cut down to within 1.5 inches of the base of the handle is satisfactory. Single-edged safety-razor blades fitted in special metallic handles are also used. Still another type, a knife used to cut fiber board, is suitable. In any case the knives are prepared for sterilization as described under (8) Forceps.

11. *Petri Dishes.* Petri dishes, 100 by 15 mm. and preferably of Pyrex glass, are recommended for plating samples. They may be sterilized conveniently in copper boxes fitted with covers.

12. *Pipettes.* Two sizes of pipettes are used, 1.1-cc. milk-dilution type and 10-cc. ordinary type. Mohr 10-cc. pipettes, whose tips have been cut off to give an opening about 3 mm. in diameter at the delivery

[1] Stevens Electric Co., Racine, Wis.
[2] Bersted Mfg. Co., Fostoria, Ohio.

end, are best for pipetting pulp suspensions. The pipettes are placed in copper boxes to be sterilized.

13. *Sample Bottles*[3]. 8-oz. wide-mouthed bottles, either glass-stoppered or with aluminum screw caps, are used for collecting water and wet stock samples. These should be selected with care so that they will withstand sterilization. The stoppers and necks of the glass-stoppered bottles are protected from contamination by metal foil, heavy kraft paper, or oilcloth. A vegetable parchment liner may also be inserted in the mouth of the glass-stoppered bottle to prevent sticking of the stopper during sterilization.

14. *Sampling Scoop.* A tinsmith can make a suitable scoop from tinned iron sheet. The diameter of the scoop will depend upon the opening of the sample bottle, while the length will be about 10 inches. A conveniently placed handle completes the scoop. The scoops are wrapped individually in heavy kraft paper kept closed by rubber bands during sterilization. If desired, a large spoon may be substituted for the scoop.

15. *Scissors.* A satisfactory type has a 4-inch cutting surface. Each pair is prepared for sterilization as described under (8) Forceps.

16. *Sterilizers.* Two types are needed, the particular style and size depending upon the needs of each laboratory: (1) A steam sterilizer, such as the pressure cooker or the autoclave. When much sterilization is required, the added convenience of a well-regulated modern autoclave will justify the additional expense. (2) A hot-air oven. For most laboratories, electrically heated ovens are more satisfactory than those heated by gas, but the latter may be used if desired. In both cases, thermometers are used to determine the inside temperature during sterilization.

17. *Template.* This is used in one procedure for taking a given weight of paper of uniform basis weight to be disintegrated. It consists of a brass plate 0.5 inch wide and of such length that it will give the proper weight of paper when sample strips are cut with it.

18. *Test Tubes.* These are used for tubing media and for making fermentation tubes. Two sizes, without lip, are needed: *(a)* 18 by 150 mm., *(b)* 10 by 75 mm. Pyrex glass is preferable, but a good grade of so-called "Board of Health" tubes is usually satisfactory.

19. *Field Outfit for Collection of Samples.* A practical field outfit, prepared as follows, may be used to facilitate collection and transportation of samples in the field, especially in paper mills. A large steel-covered suitcase, size 28 by 15 by 8 inches, is fitted with shelves and several compartments. The removable tray is fastened in the lid and two partitions are placed in it. The three compartments of the tray serve to hold sterile envelopes, dry samples in sterile envelopes, and miscellaneous small articles such as sterile knives, forceps, Scotch tape, pencils, and towels. A hinged cover for the tray completes the lid section of the case and also provides a small table upon which to work. The main part of the case contains: *(a)* a closed compartment for carrying agar plates and *(b)* a shelf. The sterile sampling bottles and sterile scoops are conveniently arranged on the shelf and in the lower portion of the case.

[3] Not needed for dry samples.

III. Chemicals and Media

1. *Alcohol.* Either methyl alcohol or 95% denatured ethyl alcohol, is used to sterilize by flaming.

2. *Standard Nutrient Agar.* Difco dehydrated nutrient agar is recommended. It may also be prepared from the ingredients, according to the procedure outlined by the Am. Public Health Assoc. *(1)*. After the medium is dissolved, the hot mixture is placed in Erlenmeyer flasks, dilution bottles or test tubes, and plugged. It is then ready to be sterilized.

3. *Special Media (2).* For the detection of coliform bacteria, and particularly the fecal type, the following media are recommended: *(a)* brilliant green bile (dehydrated); *(b)* Endo's agar (or Eosin methylene blue agar) (dehydrated); *(c)* lactose broth (dehydrated); and *(d)* Voges-Proskauer's reagent.

Note: These special media are necessary only when a determination of bacteria of the E. Coli-aerogenes group is required. Directions for their use are given in the literature *(4)*.

IV. Sterilization of Equipment and Media

Depending upon the nature of the equipment to be sterilized, one of three methods is followed.

1. *Steam Heat (pressure cookers and autoclaves).* The following are sterilized by heating for 30 minutes at a minimum of 121 deg. C. (250 deg. F.) corresponding to 15 pounds per square inch steam pressure: *(a)* sample bottles; *(b)* cups and jars for disintegrators; *(c)* media (unless sugars are present, when 20 minutes' heating at 121 deg. C. is recommended. Where other conditions are specified by the manufacturer of the medium, these should be followed); *(d)* scoops; *(e)* heavy kraft folders; and *(f)* water for dilutions.

2. *Dry Heat (electrically- or gas-heated ovens.)* The following are sterilized by heating for 4 hours at a minimum temperature of 165 deg. C. (330 deg. F.): *(a)* heavy kraft envelopes and folders; *(b)* forceps; *(c)* knives; *(d)* Petri dishes; *(e)* pipettes; *(f)* scissors, and *(g)* template.

Care must be taken to avoid overheating and consequent scorching of any paper containers or wrappers used on instruments that are being sterilized.

3. *Flaming.* Scissors, forceps, knives, and similar instruments are alternatively sterilized by flaming. Keep such equipment in denatured 95% ethyl alcohol or in methyl alcohol while not in use. When needed for cutting or handling samples, remove the equipment from the liquid, let the alcohol drain off for a few moments, then burn off the excess alcohol in the flaming equipment.

V. Sampling

1. *Frequency of Sampling.* It is an axiom in bacteriological control that occasional single samples are inadequate, since the analyses reflect the conditions which obtained only at the time when such samples were taken. The actual number of samples which should be taken depends largely on the reasons which prompt the analysis.

(a) Sampling of Lots of Paper. At least 5 representative rolls or skids should be sampled from 50,000-pound lots. For smaller lots, at least 3 representative samples should be taken.

(b) Sampling Paper on Machines. When a lot of paper is being examined during its manufacture, at least 4 samples should be taken at 6-hour intervals during each 24 hours. In some cases it may be desirable to sample every 4 hours.

2. *Paper, Paperboard, and Lap Pulp.* Two sterile envelopes, one within another, are used for each sample. Every 2 weeks a check should be made on the technique of handling these sterile envelopes by sampling the inner envelopes as if they were paper samples, and testing for bacterial content.

A method which has proved satisfactory for sampling paperboard from rolls follows: Make a vertical cut with a sterile knife through several thicknesses on the surface of the roll near the center and parallel to the edge of the roll; a second vertical cut parallel to the first and about 5 inches from the first cut; and a horizontal cut across the bottom of the first two cuts, thus allowing the cut flap to spring out from the surface of the roll. Then carefully open the sterilized envelope, tear off, and discard the top sheet of the flap, and slip the end of the cut flap of paper into the envelope. Then make a last horizontal cut across the top of the flap and about 8 inches from the bottom cut. The paper sample will then drop into the inner envelope, after which the outer envelope will be sealed by means of Scotch tape. This will give a sample approximately 5 by 8 inches. Two such samples may be taken at different sections on the roll.

This procedure can be adapted for sampling paper from skids, using flamed forceps for handling the samples of cut paper.

3. *Water and Wet Stocks.* Samples of wet pulp may be collected in different ways. They must be guarded from contamination during collection and shipment. All apparatus must be clean and sterile. The samples are either transferred to sterile wide-mouthed bottles (each bottle being from one half to two thirds full) or they are placed directly in 99-cc. dilution blanks.

Of the following procedure Method A is satisfactory for sampling wet stocks in the consistency range up to about 15%. An alternative procedure that is useful for sampling wet stocks in the consistency range from 3 to 50% air dry is described under Method B. Below 3% consistency there exists the possibility of losing during sampling some of the water associated with the pulp.

Method A. Use the sterile metal scoop or spoon for collecting the sample. Dip a sample of the stock from the vat, chest or beater, using caution to avoid contamination of the sample from the hands coming in contact with the stock. Transfer the sample to a sterile wide-mouthed bottle, discard any parchment liner used in the bottle, replace the stopper or plug in the bottle and retain the sample for dilution before plating.

Method B. Sterilize a pair of forceps by flaming. Take a sample of the stock with the forceps and transfer it to a sterile wide-mouthed bottle where it may be kept until diluted with sterile water just before plating. For immediate plating tests, transfer the required amount of sample directly to a bottle containing sterile water.

Method C. Water samples and stocks of low consistency are sampled by means of sterile pipettes.

VI. Preparation of Sample

Weighing, plating, and culturing of paper samples should be done in a room which is relatively free of air currents and dust. The surface of the work table should be sponged with a 5% aqueous solution of phenol about a half hour before plating.

A tolerance of ± 10% is permitted in the weight of the sample.

1. Dry Samples

(a) Direct Weighing Method. Weigh each sample in a tared, sterile Petri dish placed on the balance. Cut the envelope, in which the sample is received, along the flap by means of a sterile knife or sterile scissors. Open the envelope by pressing the sides, without touching the inner surface, and remove the paper sample with sterile forceps. Hold the sheet of paper in one hand, cut away with sterile scissors and discard the outer edges of the sheet. Make a series of cuts about ¼ to 1 inch apart, parallel to the side of the sheet and opposite the edge held in the hand. Remove the cover of the Petri dish and have it held by an assistant, or place it on the table in front of the balance. Cut squares of paper directly into the dish by making a series of cuts perpendicular to those made previously.

The particular type of disintegration equipment employed and the volume of liquid which it will handle satisfactorily will govern the amount of paper sample which is to be cut for disintegration. Therefore cut sufficient paper to make a 1.0% suspension of fibrous material after disintegration has been completed. Replace the cover on the Petri dish; check the weight and adjust the excess or deficiency to obtain the desired weight of sample.

(b) Alternative Template Method. Since there is a definite ratio between area and weight on a paper of uniform basis weight, a measured area of paper may be taken *(see note)*. Lay the sample, consisting of a stack of sheets, on a table. If only a single sheet is available, lay it on a piece of sterilized paper. Place the sterilized template directly on the sample and cut with a sterile knife along the edges of the template. Discard the top strip and pick up with sterile forceps the required number of strips below the top, to give the desired weight. With sterile scissors then cut the strips into small pieces directly into the disintegration apparatus. Complete the cutting and weighing as rapidly as possible to avoid undue exposure of the paper to the air.

Note: Pulp sheets are usually not sufficiently uniform in weight for this procedure.

(c) Disintegration. Place the weighed sample and the necessary volume of sterile water in the disintegrator cup or jar. In adding material to the cup do not touch the metal cap with the hands, but lift it by grasping the paper hood which was placed over the cup before sterilizing. Lift both hood and metal cap only enough to permit access to the cup. If several paper samples are to be examined, cool the water blanks to prevent the temperature of the disintegrated sample from exceeding 45 deg. C. (113 deg. F.) during disintegration. Let the paper hood reman on the cup at all times to prevent possible contamination through the opening in the metal cap or around the top of the cup. Follow the same precautions if other methods of disintegration are employed.

Place the cup containing the weighed paper sample and sterile water in the mixing machine and run for approximately 6 minutes, or until disintegration of the paper is completed. Test the sterility of the cups periodically by adding sterile water, as when examining paper, and then culturing portions of the rinse water for controls.

2. Water and Wet Stock Samples

Prepare samples of heavy stock, such as that from beaters, chests, or similar places, by collecting the samples according to the procedure described under V-3 Sampling and diluting with sterile water. Shake the diluted sample vigorously before pipetting and transferring to the Petri dish.

Determine the consistency of the diluted sample collected by Methods A or B under section V-3 by weighing the remaining sample, filtering off the fibrous material on a dried and weighed filter paper, drying at 105 deg. C. to constant weight and weighing the dried stock. This will provide data for calculating the bacterial content per unit weight of fibrous material. If the bacterial content is to be expressed as colonies per gram of stock as sampled, weigh a portion of the wet stock into a dilution blank of sterile water.

3. Control Testing of Disintegration Equipment and Technique

Make control tests on the technique of disintegration at frequent intervals by using a sample of sterilized paper and following the above procedure in detail. Plate tests on such samples should be free from colonies of bacteria.

VII. Plating and Incubating

In culturing a disintegrated paper sample, distribute with a sterile pipette a total of 10 cc. of the pulped mixture in approximately equal portions in 5 Petri dishes. Add to each plate 15 to 20 cc. of standard nutrient agar, cooled to about 45 deg. C. (113 deg. F.), then agitate the plates individually to disintegrate clumps of pulp and obtain an even distribution of the paper fibers in the media. A reciprocating motion, similar to that on the wire screen of a Fourdrinier machine, is desirable. It is important that all lumps of pulp be broken up in order that the plates may be examined easily and accurately. Pour one control plate (without paper pulp) with each set of 5 plates, thus providing an agar control for each paper sample examined.

Plate samples of pulp or water in the same way as for disintegrated paper. Since pulp may have more bacteria than disintegrated paper, it is advisable to make a sufficient number of dilutions to produce plate counts in the range of 30 to 300 colonies per plate. The degree and number of dilutions for each type of stock examined must be determined by preliminary tests or previous experience.

After the plates have been agitated, place them on a level surface until the medium solidifies; then invert and incubate the plated samples at 37 ± 0.5 deg. C. (98 ± 1 deg. F.) for 48 hours. Do not stack the plates too closely in the incubator.

VIII. Counting Plate Cultures

After incubation for 48 hours at 37 deg. C. examine the cultures for the presence and number of colonies by holding the plates against a dark background, indirectly lighted. Plate counters are especially desirable.

The amount of fibrous material distributed over a given area of plate surface has been found to be an important factor in the number of colonies observed in a given sample of paper. Therefore it is important to follow carefully the directions regarding the pulp consistency (1.0%), volume of sample plated (10 cc.), and the number and size of plates used.

If the pulp has been separated into individual fibers and mixed well in the media, the colonies may be easily counted. If any particles are observed in the cultures, which cannot be definitely identified as colonies, they should be examined microscopically. Plates with spreading colonies should be counted if at all possible; otherwise they should be reported as "spreading colonies." Examine control plates also and make a record of the number of colonies found on the control of each paper sample.

IX. Calculation of Results

Results for dry pulp or paper samples are expressed as the number of colonies per gram of airdry paper or pulp examined. Since the consistency of the fibrous suspension made from such samples is 1.0%, there is present 1.0 gram of stock in each 100 grams of suspension. A total of 10 cc. of the pulp mixture (0.10 gram of actual paper) is cultured in 5 plates. Therefore to obtain the number of colonies per gram of paper, multiply the total number of colonies found by 10.

Bacterial counts on samples of wet stock may be expressed either as colonies per gram of airdry pulp or as colonies per gram of stock as sampled. The choice of unit is governed largely by the source of the sample and by the reasons for conducting the analysis. Counts expressed as colonies per gram of airdry pulp actually include the bacterial content of one gram of pulp, and the water associated with that amount of pulp, at the point of sampling.

Express bacterial counts on samples of white water and all process waters as colonies per cc.

X. Report

Report the average number of colonies per gram (or per cc., if called for) according to the following method *(3)*:

Number of colonies per gram			Report to nearest
1	to	50	1
51	to	100	5
101	to	250	10
251	to	500	25
501	to	1000	50
1001	to	10,000	100
10,001	to	50,000	500
50,001	to	100,000	1000
100,001	to	500,000	10,000
5 0,001	to	1,000,000	50,000
1,000,001	to	10,000,000	100,000

As indicated above, the count of any particular sample of dry pulp or paper is obtained by multiplying the total count on the plates by 10. However, when the counts of several samples are to be averaged, the logarithmic method of averaging is recommended. This method of averaging tends to minimize the effect of occasional high counts which may have resulted from some transitory condition in the plant. Details concerning logarithmic averages may be found in the U. S. milk ordinance.

Example:	Count	Log.
	100	2.0
	1000	3.0
	10000	4.0
		9.0

Logarithmic average = 3.0
= 1000 colonies per gram

Literature Cited

(1) Am. Public Health Assoc., "Standard Methods for the Examination of Water and Sewage," 8th ed., p. 201 (1939).
(2) *Ibid;* pp. 197-205.
(3) *Ibid;* p. 209.
(4) *Ibid;* pp. 210, 213.

A Symposium on Spectrophotometry in the Pulp and Paper Industries

Introduction to Color Measurement of Coated Paper

(Concluded from the issue of Oct. 3, 1940)

METER: I noticed that Dr. Davis uses reflectance for blue light instead of daylight as a measure of "whiteness." I didn't realize when Mr. Hatch was talking about the "brightness tester" that it would give a practical measure of whiteness. All I would have to do is take the daylight filter out of my reflectometer, and put in a Wratten no. 49.

PAPERMAKER: Yes, then both your reflectometer and my eye ought to agree on "whiteness."

METER: Well, just as a rough check I might try it; I happen to have a set of Wratten filters here; often have to use them. No. 49 is pretty dense though. (Puts it in) Oh-oh! Just as I feared. Practically no deflection at all. It takes a stronger light source and a more sensitive photocell than I have in my portable instrument. Well, I can see that it would probably work as Dr. Davis says.

PAPERMAKER: I noticed that Dr. Davis also said most paper mills still control the color of their white paper by eye.

METER: But he adjusts opacity and reflectance in advance by measurements on handsheets.

PAPERMAKER: We will still have to find out whether such complicated planning and measurements are practical in my mill. We don't run off the same kind of paper for several months at a time the way Kimberly-Clark does; we change off every second day or so.

METER: Tell me what Dr. Davis meant by supercalendering.

PAPERMAKER: Almost every kind of paper is calendered, Mr. Meter, i.e., it is passed between heavy rolls under friction and pressure to smooth it. It is given a certain degree of this treatment at the dry end of the paper machine. If a high glossy finish is desired, it is given supplementary treatment in a supercalender where much greater friction and pressure are applied. All book papers are calendered.

METER: I don't understand, Mr. Papermaker. I've seen plenty of books with paper not polished at all. I thought it was left unpolished on purpose to cut down glare.

PAPERMAKER: It is true that many books are printed with matte-finish paper. But the great bulk of book paper does not go into books.

METER: Most book paper not used for books! Well, that certainly is news to me. What is it used for?

PAPERMAKER: For magazines mostly; some on uncoated book and some on coated.

METER: I've heard of coated paper; what is the purpose of the coating?

PAPERMAKER: The chief purpose is to give smoothness so that better halftones can be printed. Coated papers give even better printability than supercalendered.

METER: Do you put the coating right on top of regular book paper?

PAPERMAKER: Oh, no! the coating is put on raw stock,—a rough paper specially made to take the coating. But here's something you ought to know. There's been a revolution in the manufacture of coated paper lately. There is much more coated paper made and sold today than ever before, but less of it made in coating mills.

METER: Where is it made then?

PAPERMAKER: On the paper machine, itself. The new, or semicoated paper, fulfills the most urgent requirement of coating—a very smooth surface for printing. But it acquires this surface from a much lighter coating skillfully applied at very high speed.

METER: Does this new process bring in essentially different optical problems, Mr. Papermaker?

PAPERMAKER: We're finding some quite different problems in semicoated paper chiefly because of the transparency of the coating. Nothing much can be done to correct the color if the base sheet is wrong. Both base sheet and coating have to be right.

METER: I take it that you don't want me to prescribe instruments for the control of semicoated paper today.

PAPERMAKER: Well, not today. But if you help us as much as I think you are going to with uncoated papers, we'll be wanting you in the coating mill too. So I want you to hear Dr. Foote, who will discuss the color problems in coating paper. He carried on some fine work on predicting the color of dyed handsheets. Of course, this work must precede the mill problem of machine-made sheets. Now Dr. Foote will discuss his most recent problem: The Use of Spectrophotometry for Coated Paper. W. J. Foote, Jr.

Spectrophotometry on Coated Papers

By William J. Foote[1]

Abstract

By means of spectral reflectance curves, dyestuffs may be identified either in coated or uncoated papers and rough quantitative estimations made. In addition, spectral reflectance curves may be used to specify the color of standard grades, to act as a guide in color matching in general, and particularly in the

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case of matching the color of base sheet and coating of tinted whites and to indicate tolerances.

A more precise method of specifying standard colors and tolerances consists of using chromaticity diagrams based on the specification of color by the method proposed by the International Commission on Color (I.C.I.) in 1931.

By the use of one additional measurement (either R_0 or $R_{.97}$ at any chosen wavelength) and calculations involving the Kubelka and Munk relationship, valuable information is obtained on the fundamental optical coefficients (scattering and absorption) of coatings made up with various types of pigments. This permits a study of the effects of different raw materials and the successive steps in the process of manufacture on color, gloss, and apacity of the finished product.

The relation of the physical measurements, brightness and visual efficiency (Y), with visual "brightness" and "whiteness" and the possibility of there being an optimum color for white printing papers is briefly discussed.

This paper should properly be titled "A Few Homely Truths and Wild Vagaries" for colorimetry as applied in the paper industry has been well covered in the *Paper Trade Journal* and other trade journals in both elementary and high-powered physical treatments. And although the physical measurements referred to by the other authors are fundamentally sound and of practical value both for development and control, the question of paper color from a use angle must always wind up in the half-world of psychological interpretation.

Speaking physically, subjective variation has been eliminated by the adoption of the I.C.I. standard observer. There is no further need to justify the validity of the accurately measurable spectral reflectivity curves nor the conversion of physical measurements to a numerical specification in terms of their psychophysical effect by use of the I.C.I. system. So far as research is concerned, these fundamentally sound methods must be used.

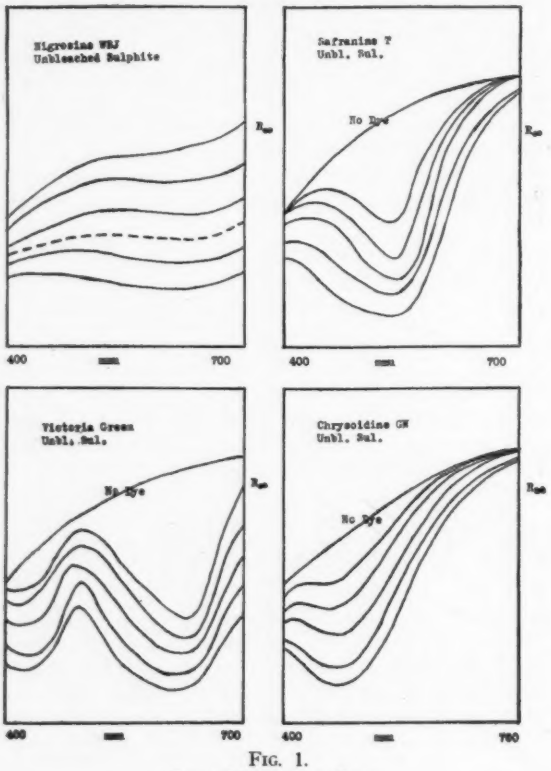

FIG. 1.
Spectral Reflectivity Curves

Nevertheless, until the consumer purchases his paper on the basis of physical specifications, there will be confusion between manufacturer and user due to a lack of a common color terminology, variation in individual sensitivity, and confusion of chromaticity with whiteness. When it is remembered that there are hundreds of thousands of perceptibly different colors, that several individuals may have several differing sensations evoked by the same stimulus, and that an individual's conception of a color (as well as the material standard itself) may vary from day to day, the need for a strictly reproducible method of color evaluation and specification is amply proven.

Terms Used in the Discussion

The terms reflectivity R_∞; reflectance over various backgrounds R_0, $R_{.97}$, and R_B'; scattering and absorption coefficients; refractive indices; tristimulus values; trichromatic coefficients; dominant wavelength L; purity p; and visual efficiency Y are already familiar. The last three terms mentioned correspond to the subjective attributes of color: hue, chroma (saturation), and value (brilliance).

Color may be defined as the sensation effected in the brain of an observer by a physical stimulus. This stimulus is the subjectively integrated product of the sensitivity functions of the particular observer, the spectral energy distribution of the illuminant, and the spectral reflectivity characteristics of the body being observed. The spectral reflectivity curve is an inherent function of the raw materials making up the sample (paper) and as such is accurately measurable by physical means. Reflectivity at any one wavelength is closely related to the scattering and absorption coefficients. These fundamental constants are valuable aids in interpreting changes in reflectivity—and, hence, color. They are also related to other optical properties of paper such as opacity and brightness which are as important to producer and consumer as color.

Use of Instruments as Analytical Tools

The base sheet or raw stock has been thoroughly covered from a colorimetric point of view by Davis *(1)* and Griesheimer *(2)*. Therefore, it shall be considered as a homogeneous raw material used in the manufacture of coated paper. It must meet certain specifications. The most important ones for coated printing papers include a certain minimum strength and sizing, smoothness, porosity, formation, and the optical properties—brightness, opacity, gloss, and color—specified on some rational basis.

There is, however, one point which might be stressed a bit more. That is the effect of the dyes used in coloring the base sheet. The base sheets considered will be confined to lightly tinted papers, i.e., papers with high visual efficiency and extremely low excitation purity. The dominant wavelengths may vary widely.

The spectral reflectivity curve of any paper colored with a simple dye formula will identify specifically the dyes used. The only requisite in interpreting the curves is a previous knowledge of the type of curve which a given dye will produce. Figure 1

shows the spectral reflectivity curves produced on a 100 per cent unbleached sulphite paper by increasing amounts of four different basic dyestuffs: Nigrosine WSJ, Safranine T, Victoria Green, and Chrysoidine GN. The undyed sheets are so labeled. The solid lines represent dyeings of ¼, ½, 1, 3, and 5 lb. of dye per 1000 lb. of pulp, reading from top to bottom.

There are two criteria for identifying the dyes. First, each dye has a definite wavelength of maximum light absorption. The curves for Safranine in Fig. 1 are, from top to bottom: no dye, 0.25, 0.5, 1, 3, and 5 lb. of dye per 1000 lb. of pulp. It will be noted that all five colored sheets have absorption maxima at approximately 536 mmu. In addition, it will be noted that the wavelength range of light absorption is rather narrow in this case. Other red dyes may have absorption maxima near 536 mmu, but each will have a characteristic shape to its curve. If the two curves did not differ in some respect, the dyes could be used interchangeably. The maximum for Magenta is at 560 mmu and for Rhodamine at 564 mmu, but the shapes of all three curves differ considerably. The absorption maxima will vary slightly depending upon which type of pulp is being used, because pulp and dye do not absorb light independently. The actual relationship is not definitely known. Magenta dyeings have maxima at 554 mmu on groundwood and at 560 mmu on kraft. The absorption maxima tend to shift slightly toward the red with increasing weights of dye.

Simple cases of papers dyed with a single dye will rarely be encountered. However, Fig. 2 shows various combinations of two dyes on unbleached sulphite. The two upper diagrams and the one on the lower left show the spectral reflectance curves for various combinations of Fuchine and Victoria Green. Even in this more complex case, it is possible to identify each of the dyes present. Of particular interest is the diagram on the lower right where curves *A* and *B* show identical amounts of Victoria Green (0.25 lb.) with two different amounts of Safranine.

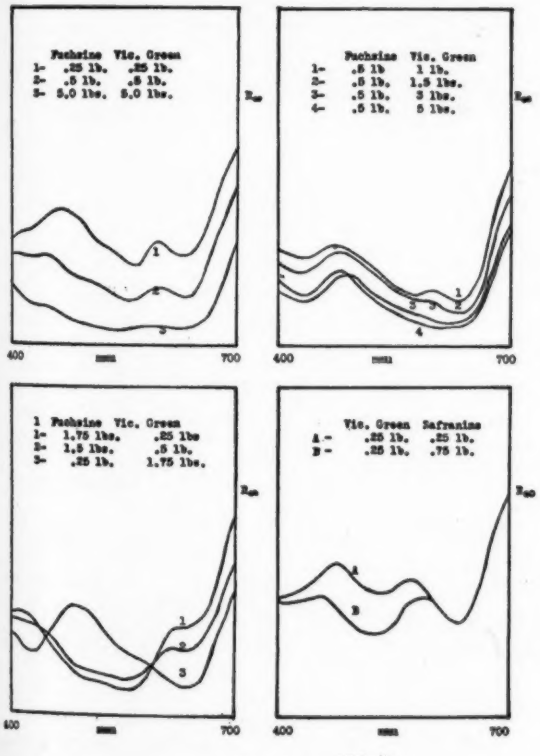
Fuchsine Vic. Green
1- .25 lb. .25 lb.
2- .5 lb. .5 lb.
3- 5.0 lbs. 5.0 lbs.
Fuchsine Vic. Green
1- .5 lb 1 lb.
2- .5 lb. 1.5 lbs.
3- .5 lb. 3 lbs.
4- .5 lb. 5 lbs.
1 Fuchsine Vic. Green
1- 1.75 lbs. .25 lbs
2- 1.5 lbs. .5 lb.
3- .25 lb. 1.75 lbs.
Vic. Green Safranine
A - .25 lb. .25 lb.
B - .25 lb. .75 lb.
400
mmu
700

FIG. 2.

Spectral Reflectivity Curves of Dyed Papers

It is well known that transmission curves of dye solutions and reflectivity curves of dyed fibers absorb light selectively, and that, with some exceptions, all have some range wherein they do not differ in transmission or reflectivity from distilled water or undyed fiber. The exceptions are the black dyes which absorb light of all wavelengths in the visible spectrum and the deeper weight dyeings of almost all dyes. In the particular case shown by curves *A* and *B*, there is no overlapping of the absorption ranges of these two dyestuffs.

Some dyes, it must be admitted (particularly in combinations), will be almost indistinguishable on the basis of inspection of their spectral reflectivity curves. Two typical cases are the similarity of the Du Pont dyes Paper Blue R to Methyl Violet NE and Chrysoidine GN to Basic Brown BR. But since the purpose of any dye identification is undoubtedly to act as an aid in color matching, it is immaterial whether the dyestuff used was, for example, Paper Blue R or Methyl Violet, since either one may be used to match the color of a sheet dyed with the other.

And in this way, even if the spectral reflectivity curve shows the paper to be dyed with a dye with which the observer is unfamiliar, it enables him to decide which of the dyes available will come reasonably close to matching the sample being analyzed. In specific cases, this preliminary establishment of an approximate dye formula to meet the color sample may be of great value in avoiding the production of unsalable paper, while the color man is adjusting his dye formula.

A mill was encountering particular difficulty in matching a submitted sample. A spectrophotometric analysis of sample and mill run showed the sample to have the spectral reflectivity curve indicated by the broken line in Fig. 3; the paper made had the curve shown by the solid line. It can be seen that the sample is dyed with two dyes whereas a single dye was being used in the mill. A perfect match could never be achieved by this particular dye, either alone or in combination with other dyes.

Selecting Dye Formulas

The quantitative relation of weight of dye (concentration of dye on the fiber) to reflectivity has been discussed thoroughly. Briefly, the weight of dye is related to the K/S ratio which, in turn, is related to reflectivity. The relationship deviates from a straight line as the weight of dye increases, less absorption being observed per unit weight of dye than is predicted *(3)*. The relationship may be used empirically as suggested by Nolan *(4)*, particularly in the range of dyeings below 1 lb. per 1000 lb. of pulp.

A rougher, but more practical, expedient is to estimate the quantity of dye directly from the spectral reflectivity curve. This estimation, as with the identification, must be based on previous experience. For example, let the broken line in Fig. 1 represent

the curve of the sample submitted for matching. Knowing that the three bottom solid lines represent 1-, 3-, and 5-lb. dyeings, respectively, it may be estimated that the sample could be matched with approximately 1.5 lb. of Nigrosine on unbleached sulphite. In the cases of complex dye formulas, the estimation will be considerably more difficult since the two dyes will practically always have overlapping absorption ranges.

These two methods are presented only as aids in selecting dye formulas since the latter is a very rough approximation and the former is tedious and not strictly reliable.

Optical Characteristics of Mineral Pigments

Most of the common mineral pigments encountered in machine coating are shown in Table I. In using this table, a warning by Steele *(5)* must be observed. Reflectivity, scattering coefficient S, and absorption coefficient K, vary according to the use to which the pigment is put, and the condition in which it appears in the sheet. This may be considered analogous to the case of the K value of dyestuffs varying on different types of pulps. There is a relationship between refractive index and scattering coefficient of a coating which is a function of the difference in refractive index between the pigment and the adhesive.

Therefore, it is necessary to evaluate the pigments presented in Table I as used and to obtain the K and S values of each from measurements made on coated papers. It is to be emphasized that there is nothing absolute about the figures. There are two ways of applying the calculations. The Kubelka and Munk equation *(6)* may be applied directly to the coated sheet by utilizing R'_∞ and $R'_{.97}$ of the sheet itself, although in this case the material is obviously heterogeneous and as such is not calculable by the equation which was developed on the fundamental assumption of a diffuse-reflecting homogeneous material.

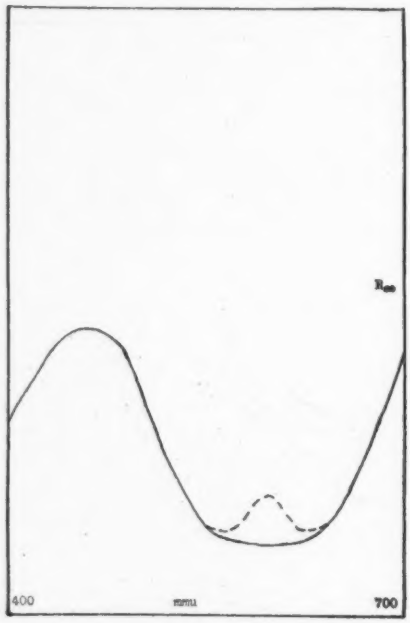

FIG. 3.
Spectral Reflectivity Curves

TABLE I.—SCATTERING AND ABSORPTION COEFFICIENTS OF COATING MIXES

Sample	$R_{B'}$	$C_{.97}$	R_∞	SX	K/S	S	K
Base sheet			.868				
Clay	.871	.925	.898	0.478	.00579	0.598	3.46
TiO_2	.889	.937	.902	4.223	.00532	7.036	37.43
$TiO_2 \cdot BaSO_4$	.881	.913	.910	1.654	.00445	3.313	14.74
$TiO_2 \cdot CaSO_4$	.889	.940	.948	2.890	.00143	7.225	10.33
$CaCO_3$	.877	.913	.971	0.581	.00043	1.162	0.50
ZnS	.898	.945	.948	2.762	.00143	4.603	6.58
$ZnS \cdot BaSO_4$	.889	.918	.955	1.645	.00106	2.056	3.18

The second method would be to use the equation as used by Steele, taking R' as the reflectivity of the base sheet. Then K and S may be calculated for the coating as an entity. As a convention, R_∞ will refer to an opaque thickness of coating alone, and R'_∞ will refer to the reflectivity of an opaque pad of coated one side sheets. For measuring the coefficients of the coating alone, we are confined to measurements on the coated but not supercalendered sheet, because the supercalenders reduce the caliper to less than that of the original base sheet. What the thickness of the coating itself is after supering is practically impossible to determine.

Both measurements may be utilized empirically in the following way: the coefficients of the coating alone may be measured on the basis of R_∞ and $R_{B'}$; then, they are calculated for coated and supered sheets on the basis of R'_∞ and $R'_{.97}$. Although the K and S values for the coating and for the coated sheet will be different, they will be of value in interpreting coating behavior. The first is a fundamentally sound method, the second an empirical method with no basic foundation.

The equation for calculating SX for the coating alone is a rearrangement of an intermediate step by Steele in the derivation of his equation III *(6)*:

$$SX = \left(\frac{2.303}{(1/R_\infty - R_\infty)} \right) \log \left(\frac{(R_{B'} - 1/R_\infty)\ (R' - R_\infty)}{(R' - 1/R_\infty)\ (R_{B'} - R_\infty)} \right) \quad (1)$$

where R' is the reflectivity of the base sheet. In this case, R' was 0.868, because measurements were made on the eighth filter of the brightness tester[3]. When calculating SX for a pad of coated sheets, R' is taken as 0.97 since the reflectance is measured over magnesium carbonate.

Use of I.C.I. Coordinate System in Matching Color

In the field of light weight coatings, there are two color matching problems. There is, first, the matter of matching the coating color with the color of the base stock; and, second, the problem of matching the standard color for a given grade or of matching submitted samples in establishing new grades. When it is considered that the approximate thickness of a 15-lb. coating is .0005 in. on either side, it can be seen that unless the pigment is one of high refractive index, the coating will not be optically opaque. In fact, until the basis weight reaches the vicinity of 85 to 90 lb. per ream (25 x 38—500), the entire sheet will be translucent. The usual printing weights range from 40 to 60 lb. per ream. Therefore, it is essential that a reasonably close match be obtained between coating and raw stock.

For the purpose of matching the standard color, the spectral reflectivity curve will be of the most

[3] General Electric reflection meter was used.

practical value. Its measurement is rapid enough to permit its use as a control test. It has been mentioned that when the spectral reflectivity curves of two samples are identical, the two will match for any observer under any type of illumination (assuming the same geometry of viewing). There is the possibility of two curves differing so slightly that they will match under one light source but not under another. This will be particularly true if it is necessary to match a sample using different dyestuffs than were used originally. One unusual example of this phenomenon is shown in Fig. 4. These two samples matched almost perfectly under daylight conditions but Sample 2 was much redder in artificial (tungsten filament) light. Consideration of the spectral energy distribution of the two illuminants explains the behavior quite simply.

If the two curves do not coincide, it is necessary to provide some criterion by which the color man can judge whether the match is acceptable or not. It is generally accepted that the eye is capable of distinguishing between brightness differences of about 2 per cent of the reflectivity value, i.e., the eye can distinguish between 49 and 50 or between 98 and 100. However, the eye is more sensitive to chromaticity differences, so that the permissible limits for a commercial match will be more of the order of 0.5 per cent reflectivity in the cases shown in Figs. 5a and 5b. In the case of Fig 5c, about 1.0 per cent to 1.5 per cent would be permissible. Figure 5d represents a type of color match upon which a strict numerical reflectivity tolerance cannot be specified. Samples having curves of this general nature and separated by a maximum of 0.8 per cent at most and being superimposable at each end of the visible spectrum did not make a satisfactory match. As a matter of fact, the customer's complaint was on "brightness" although the two samples yielded identical readings on the reflection meter. When the curves are the same at both ends of the spectrum, it is generally a simple matter of adjustment of the proper quantity of dye to make the match.

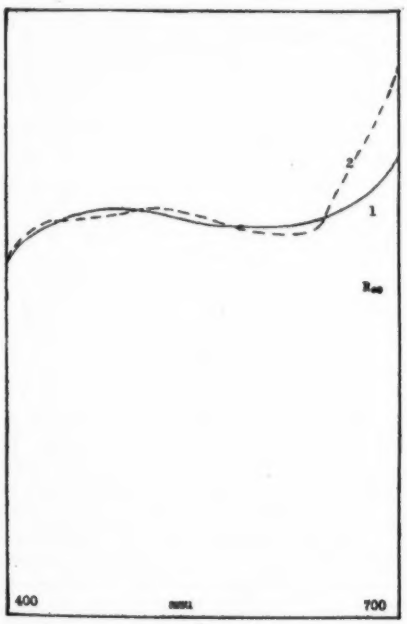

FIG. 4.
Spectral Reflectivity Curves

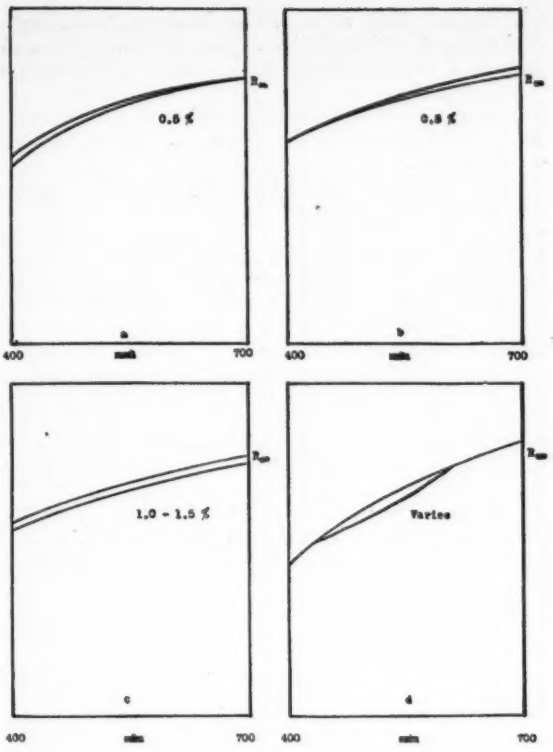

FIG. 5.
Spectral Reflectivity Curves. Permissible Tolerances for Various Departures

For the type of chromaticity difference encountered in Fig. 4, the I.C.I. chromaticity diagram may be used very aptly to give precise color matches (for a particular illuminant—usually average daylight). The method of utilizing chromaticity data for color matching has been described *(7)*. Necessary information includes the chromaticity data on various weight dyeings of each dyestuff alone and enough combinations to permit the drawing of contour lines for constant total weight dye and for constant ratio of first and second dyes. Figure 6 shows the families of lines for different basic dyes on unbleached sulphite pulp. The dotted lines represent arbitrarily drawn contour lines based on experimentally determined colors of various combinations of the two dyes, whose families of individual dyeings immediately enclose this area.

On the basis of information of this type, it is possible to specify very closely the formulas of available dyestuffs for matching the sample. It is to be stressed that the visual efficiencies resulting from various combinations of dyes must be watched as closely as chromaticity. Often, a combination of dyes yielding contour lines immediately surrounding the point specifying the color of the sample on the chromaticity diagram will permit a chromaticity match but not a visual efficiency match. The accumulated data (and it is here necessary to point out that this data must be collected in each mill due to slight differences in pulp quality) will permit selection of dyes which will yield a match in both chromaticity and visual efficiency. If the trichromatic

coefficients (and, as a result, dominant wavelength and purity) are identical, and the visual efficiencies of sample and match the same, the paper made will be a match under the particular illuminant by which these figures were calculated, irrespective of the coincidence or noncoincidence of the respective spectral reflectivity curves.

Interpolation of visual efficiency data for the case of various dye combinations should be restricted to cases; where the value for the sample lies between experimentally determined values in such a range, that the variation of Y with weight of dye is practically a straight line. In certain cases, the visual efficiencies of mixtures of a constant total weight of dye are lower than those of a similar weight of either component alone. In other cases, the values are directly proportional throughout a large weight range.

With tinted whites, almost all trichromatic coefficients may be plotted within the area covered by chart 12A of the "Handbook of Colorimetry" *(8)*. This area includes x-values from 0.2750 to 0.3550 and y-values from 0.2800 to 0.3800, and is the area within which the contour lines will be the straightest and closest together.

There are not much data available in evaluating chromaticity matches on the basis of trichromatic coefficients. A general approximation is that a change in x or y of 0.001 will correspond to a *least perceptible difference* (L.P.D.). How many L.P.D. are allowable in a commercial match has not been definitely determined. Nutting *(9)* found the average difference between sample and match in x and y values for 41 satisfactory commercial matches of color on dyed textiles to be 0.0045. However, this is a greater tolerance than would be generally acceptable for paper. In the case of eight commercial papers matched in the laboratory *(7)*, the average differences between x values for sample and match was 0.0006 and for y values, 0.0022. The other specifications are presented in Table II.

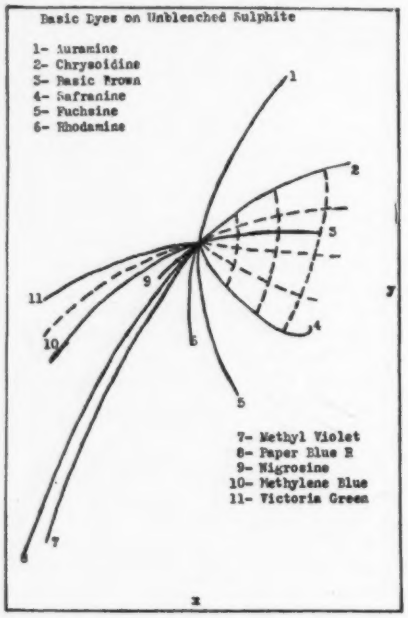

FIG. 6.
Color Mixture Diagram

TABLE II.—DOMINANT WAVELENGTH, VISUAL EFFICIENCY, AND EXCITATION PURITY

(Eight samples of commercial paper matched in the laboratory)

Sample			Match		
Y %	L mμ	p %	Y %	L mμ	p %
51.4	569.9	5.3	52.3	569.7	6.0
40.5	567.0	8.8	40.7	568.4	9.2
74.9	575.3	35.8	75.4	575.0	34.0
35.3	493.0c	24.0	33.5	494.3c	23.8
45.0	581.7	23.3	47.6	579.9	24.0
63.2	578.4	16.5	63.2	578.2	15.9
9.0	475.0	31.8	10.8	475.2	27.8
44.0	581.7	7.8	45.2	581.7	7.7

A glance at the table indicates that a reasonable approximation for tolerances in visual efficiency would be 1.2 per cent; for dominant wavelength, about 1.0 mmu; and for purity, about 1.0 per cent. These samples cover a large range of visual efficiencies and are, therefore, lenient with respect to visual efficiency tolerance if applied to nearly white papers. The tolerance for chromaticity, a term incorporating dominant wavelength and purity, drops rapidly as the visual efficiency decreases.

Effect of Coating and Subsequent Treatment on Color

Since the mineral pigments used in coating are usually considerably brighter than the fibers making up the base sheets, there is, in effect, a dilution with white upon coating. Upon supercalendering, there follows a blackening. To establish the maximum effect which such a dilution could have, Table III shows the result of arbitrarily adding and subtracting 10 per cent reflectivity to the spectral reflectivity curve of the paper specified under "sample".

TABLE III.—EFFECT OF ADDING WHITE OR BLACK TO A NEARLY WHITE PAPER

		Sample	Sample plus white	Sample plus black
Tristimulus values	X	76.9	86.7	67.1
	Y	78.3	88.3	68.3
	Z	88.3	100.1	76.5
Trichromatic coefficients	x	.3158	.3152	.3167
	y	.3216	.3210	.3223
	z	.3626	.3638	.3610
Dominant wavelength, L		578.3	578.6	578.4
Excitation purity, p		2.9	2.6	3.4

Of course, in practice, there is never an increase of 10 points, nor is the increase parallel. Supercalendering reduces the visual efficiency about 2 to 3 point. For the theoretical case, the brightening or dulling effect of coating and supercalendering will not spoil a chromaticity match.

Table IV gives the specifications for the curves shown in Fig. 7. Curves 3, 1, and 2 are respectively the base sheet, coated, and supercalendered sheets. In Table IV, Samples C4, C6 and C5 are base, coated and supered sheet for a second paper.

TABLE IV.—COLOR SPECIFICATIONS OF BASE, COATED, AND SUPERCALENDERED SHEETS

Sample	x	y	Y, %	L, mμ	p, %
3	.3265	.3340	79.4	576.4	9.1
1	.3235	.3290	82.3	578.1	7.0
2	.3252	.3326	79.8	576.4	8.4
C—4	.3129	.3208	81.1	571.0	2.0
C—6	.3126	.3212	86.3	569.0	2.0
C—5	.3112	.3211	84.9	561.6	1.6

Compared to Table III, the major difference noted is that the change in dominant wavelength is of an entirely different order of magnitude. These examples show the case where a chromaticity match must be made at different levels of visual efficiency. Reconsidering the tolerance limits roughly indicated for spectral reflectivity curves separated slightly nonparallelly, it can be seen that recourse must be had to the trichromatic coefficients in evaluating the color match. Fig. 7 shows the effect of a close color match throughout the major part of the visible spectrum between the base and supercalendered sheets.

Because of the particular fiber furnish (the presence of groundwood is indicated, as always, by a low reflectivity in the violet), the reflectivity was raised relatively in the violet and maintained there even after supercalendering. Nevertheless, the dominant wavelengths of rawstock and supered paper are identical. As would be expected, the supered sheet has a higher visual efficiency and a lower purity. In other words, it is 'whiter'.

Table V presents similar data for another paper and contains the additional measurements $R'_{.97}$ and R'_{∞} which permit calculation of contrast ratio $C'_{.97}$ as well as S and K. In uncoated papers, it is generally permissible to assume that basis weight is roughly proportional to caliper and to use pounds per ream as X in calculating the absorption and scattering coefficients. However, in the case of coated papers, the caliper is greatly reduced by supercalendering while the basis weight remains almost the same. Therefore, X is used as thickness in thousandths of an inch.

The obvious results of supercalendering are smoothing of the paper, development of gloss, decrease of opacity and visual efficiency. The well-known phenomenon of decreasing opacity with increasing wavelength is noted in measurements made on these samples at 450 mmu, 550 mmu, and 650 mmu. The decrease in opacity of the supered sheet is relatively greater than that of the coated sheet. This leads to the discovery that SX does not remain constant upon supercalendering, but that KX does remain approximately constant.

TABLE V.—COLOR SPECIFICATION, OPTICAL CHARACTERISTICS OF COMMERCIAL COATED PAPER

Sample	x	y	Y_t %	L_t mμ	p_t %
Base	.3153	.3232	77.6	573.5	3.3
Coated	.3144	.3208	79.5	576.0	2.4
Supered	.3158	.3216	78.3	578.6	2.9

Sample	$R'_{.97}$	R'_{∞}	K/S	SX	X	S	K	$C'_{.97}$
Base	.942	.876	.0088	2.503	3.2	0.78	6.9	.806
Coated	.927	.881	.0080	4.178	3.8	1.10	8.8	.874
Supered	.921	.866	.0104	3.527	2.7	1.31	13.5	.861

The data presented in Table VI for the same paper supered to different degrees of gloss indicate the blackening developing as the paper is supered harder.

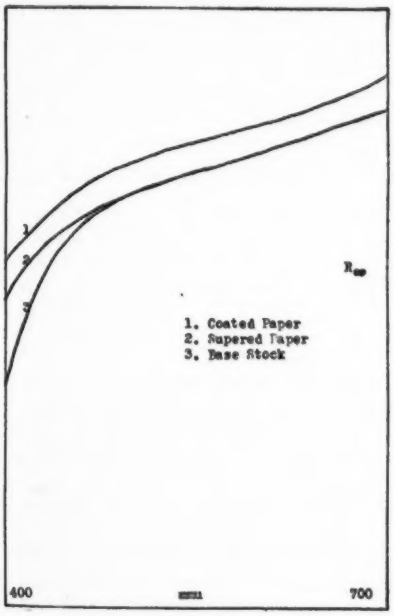

FIG. 7.
Spectral Reflectivity Curves

The components of the sheet are being pressed more closely together and air-fiber and air-pigment interfaces are being reduced in number. Reduction in number of interfaces naturally reduces the amount of scattering. With less scattering, the sheet is less opaque and has a lower visual efficiency. The blackening on supering results in increasing dominant wavelength for this particular sample. The increase would be more noticeable in a paper of higher purity.

TABLE VI.—RELATION OF GLOSS TO COLOR SPECIFICATIONS.

Gloss[1]	Opacity[2]	x	y	Y_t %	L_t mμ	p_t %
38	92.7	.3128	.3186	79.7	577.0	1.4
40	91.0	.3137	.3187	78.6	582.0	1.6
42	90.2	.3142	.3190	78.2	582.6	1.8
44	90.5	.3148	.3181	77.2	589.0	1.8

[1] Ingersol
[2] Bausch and Lomb

The amount by which the blackening may be limited depends upon other than colorimetric criteria. Printing quality with its interrelation of ink absorptivity, smoothness, gloss, and opacity is naturally the major aim. Within limits, printing quality may be balanced against color as it is affected by the supercalenders. The balance also depends to a large extent upon the type of materials being used.

Whether physical printing properties of paper may be sacrificed to a slight extent to produce a more 'pleasing' color throws the question directly into the field of psychological interpretation.

Ideal Color for Printing Papers

There is really no physical basis for the preference of a given hue in high whites. Whiteness refers to lack of chromaticity and may be defined in relation to its degree of approach to the appearance of magnesium oxide, considered the best realizable white. With respect to spectral reflectivity, it means a straight line parallel to the wavelength axis. An achromatic paper would hardly be called white, however, unless its brightness—in this case, the brightness and visual efficiency would have identical numerical values—were at least above 60 per cent.

Paper may vary from whiteness either chromatically or achromatically. The chromatic differential can best be measured on the I.C.I. chromaticity diagram althought the L.P.D. will be of varying linear magnitude in different portions of the diagram. Judd's uniform chromaticity scale triangle *(10)*, a transformation of the I.C.I. diagram in which uniform distances represent equal chromatic variations, is applicable to the case of paper color especially when interpreting whiteness as a single number on the basis of MacAdam's formula *(11)*.

Although light measurements are extremely accurate, specifications of brightness or whiteness which are based on the standard observer will not always correlate with visual judgments. Variations in the sensitivity of different individuals is an acknowledged fact. Some people will prefer a reddish white to a blue white. By "prefer" is meant that if they are given two sheets of equal brightness, one of reddish and one of bluish hue, they will judge the reddish one to be the brighter. The majority of color graders, however, will prefer the blue white although the visual efficiency of a blue white must be less than that of a red white of equal brightness. The blue white will approach more closely to the spectral reflectivity of magnesium oxide and as such will be whiter. It is entirely possible that slight shifts in the visibility response curve to slightly higher or lower

wavelength maxima results in this variation in visual judgments. On the other hand, it has been shown by Judd *(12)* that, in judging yellowish whites, experienced graders tended to confuse brightness with chromaticity. About one-third of his observers apparently judged whiteness in comparison to magnesium oxide, and one-third based their judgments on a standard which was slightly greenish-yellow. This is sometimes called "neutral paper white" being the color of paper made from bleached sulphite with no dye added. Of course, some bleached sulphite is definitely reddish.

So far as a combination of pulps and dyes is concerned, there is definitely a point on the chromaticity diagram which it is not wise to pass in attempting to make a paper achromatic. For example, with a groundwood-content base sheet, it is practically impossible to tint to a blue white. By the time the sheet was achromatic, it would be so dulled (low visual efficiency and brightness) that it would have lost all attractiveness. Theoretically, for any furnish, the lower the excitation purity, the whiter the paper. To be a perfect white, however, the visual efficiency would have to be reduced approximately to the reflectivity value at the wavelength of maximum light absorption (the lowest point on the particular spectral reflectivity curve).

With a given chromaticity to start from, wise selection of dyes will generally result in decreased purity. This would not necessarily straighten out the spectral reflectivity curve. Whether it would cause the resulting color to be judged whiter, is a question involving all the factors of subjective interpretation previously mentioned. A sample can show a greater selective reflectivity and still be generally classified as white when the sample has a high level of reflectivity *(12)*.

Conclusion

It seems logical to assume that the reason blue whites are so generally preferred is that the majority of undyed bleached pulps will be slightly on the yellowish or reddish side. A trace of blue dye will move the chromaticity specification in the direction of the point specifying the color of magnesium oxide illuminated by I.C.I. illuminant *C*; it will also be moving toward the point specifying neutral paper white, if the addition of dye is small. Judd's results indicate this to be true. He also found that the whiteness decreases rapidly when enough dye has been added to cause the chromaticity specification to pass the standard point.

Lewis *(14)* published an interesting example of the color changes undergone by the paper used in a nationally distributed magazine. One mill offers the publisher a sheet more heavily dyed with blue, for instance. The publisher likes its appearance and all the other mills supplying him have to change to the new color. This cycle may occur as often as once a year with some publishers. Unfortunately, each publisher may prefer a slightly different color—and get what he wants, the customer always being right. For that reason, it is improbable that there will ever be an optimum hue for white printing papers. Undoubtedly, physicists could balance minimum *chromaticity* against maximum *visual efficiency* for any given furnish. But until paper is purchased on physical specification of color, they will always be stymied by subjective judgments, and even thereafter will still have to contend with the problem of which is the optimum color.

Acknowledgments

The author is indebted to Fred E. Culp for his kindness in preparing the coatings discussed in the section on optical characteristics of mineral pigments.

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(The End)

New Lantern Ring Puller

Designed especially to ease the lot of maintenance men, the new built-in lantern ring puller, that is a feature of "Lightnin" tripod mixer construction, has met with widespread approval from plant owners as well. "Lightnin" mixers are built by the Mixing Equipment Company, Inc., of Rochester, N. Y.

By making removal of the entire lantern ring a matter of a few seconds, maintenance men are sure to replace packing below the ring as well as above. This in turn lengthens operating life by reducing wear.

Operation of the puller is extremely simple. Once the upper packing is removed, the puller bolts are threaded into the lantern ring. Compressor nuts are used below the compressor ears to pull out entire assembly. No special tools are needed and the whole operation takes but an extremely short time. "Fishing" for hard to remove lantern rings is completely done away with and risk of marring or scratching "frozen" rings, as well as possible damage to the shaft, is eliminated.

This type of construction is well adapted to most types of stuffing boxes where repacking is a problem, as is shown by the fact that Mixing Equipment stuffing boxes are built to withstand 150 lbs. per square inch pressure or 29 inches of vacuum.

Roehlen Engraving Works Expand

Expanding operations of Roehlen Engraving Works, Inc., of Rochester, N. Y., has made necessary additional space for machinery and warehouse. This new addition has just been completed and now gives this company a total of 17,500 square feet of working space, thereby making this plant the largest of its kind in the United States and Canada.

Specializing in engraved rollers and plates of every description, they are equipped to handle any job regardless of size or requirements. Bronze rollers for watermarking papers, solid steel rollers for embossing all types of papers, and rollers matched to run together for embossing protective packing papers, such as egg carrier stock, insulating and deadening fibre, etc., are only a part of the many requirements supplied by this firm.

W. F. Roehlen is president; L. R. Vohs. vice-president; H. S. Vohs, treasurer; C. R. Kerrigan, secretary.

Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Bleached Sulphite More Acute—Some Grades of Old Waste Lower.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations, were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING OCTOBER 5, 1940

SUMMARY

Newsprint .....15,352 rolls
Cellophane paper.....3 cs.
Miscellaneous paper .....16 cs.

NEWSPRINT

H. G. Craig Co., Inc., ——, Donnacona, 377 rolls.
——, ——, Liverpool, N.S., 6,217 rolls.
H. G. Craig Co., Inc., ——, Donnacona, 330 rolls.
International Paper Co., ——, Gatineau, 307 rolls.
H. G. Craig Co., Inc., ——, Donnacona, 381 rolls.
——, ——, Comeau Bay, 7,409 rolls.
H. G. Craig Co., Inc., ——, Donnacona, 331 rolls.

CELLOPHANE PAPER

Sherwin Bros., ——, Yokohama, 3 cs.

MISCELLANEOUS PAPER

——, ——, Yokohama, 16 cs.

RAGS, BAGGINGS, ETC.

——, *Monterey,* Havana, 8 bls., 7 bags old rags.
——, *Brazil,* Buenos Aires, 18 bls. rags.
Williamson Products Co., *Brazil,* Santos, 260 bls. linters.
New England Waste Co., ——, Colombo, 400 bls cotton waste.
Irving Trust Co., ——, Shanghai, 300 bls. cotton waste.
Manufacturers Trust Co., ——, Shanghai, 150 lbs. cotton waste.
Pan American Trading Co., ——, Shanghai, 100 bls. cotton waste.

OLD ROPE

——, *Pastores,* Cristobal, 2 bls.
——, *Talamanca,* Havana, 1 pkge.

GLUE STOCK

Milligan & Higgins, ——, Buenos Aires, 31 bls., 118 bags.

CASEIN

Packing Products Co., ——, Buenos Aires, 334 bags, 20,040 kilos.
American British Chemical Supplies, ——, Buenos Aires, 2,000 bags.
Packing Products Co., ——, Buenos Aires, 334 bags.

LOS ANGELES IMPORTS

WEEK ENDING OCTOBER 5, 1940

——, ——, Shanghai, 8 bls. rags, 247 bls. waste bagging.
——, ——, Ocean Falls, 2,668 rolls newsprint, 126 pkgs. paper stock.
——, ——, Yokohama, 1 cs. rice paper, 1 cs. writing paper.
——, ——, Osaka, 5 cs. stencil paper.

Green Mountain Tissue Co. To Start

According to press reports Frederick W. Vogel of Berlin, N. J. and Worcester, Mass. and Allen J. Nadeau of North Brookfield, Mass., co-partners operating as the Green Mountain Tissue Company, are making arrangements for the establishment of a new industry at the now vacant paper mill of the Blake & Higgins Company at Bellows Falls, Vt.

The mill will manufacture sanitary tissue, facial tissue, hospital wads and other types of cellulose wadding, Vogel said. For the present the material will be put into the hands of agents in roll form as it comes from the machine. Later, Mr. Vogel said, the firm hopes to install machinery to convert the substance into finished tissue products.

This expansion, not planned for about a year, would necessitate employing a large number of women, he stated. For the present the machinery now standing in the mill will be converted to use, the date of opening depending upon the number of repairs found necessary.

Mr. Vogel, a graduate of Dartmouth in 1922, taught chemistry at the college for two years and there received his master's degree.

He has been affiliated with a number of manufacturing concerns, most recently with the San-Nap-Pak Manufacturing Company, in Wheelwright, Mass. Previously he was with the Brown Paper Company, Berlin, N. H., for 15 years.

His partner, Mr. Nadeau, has been superintendent and manager of several mills and is now associated with the San-Nap-Pak Company. He formerly was with the Gould Paper Company and Pond's Tissue Company.

Vogel, who has been in town this week making arrangements for taking over the mill property, has established temporary headquarters at 9 Church Place.

The Blake & Higgins plant, shut down for several years, was sold for taxes last May by the town of Westminster. W. C. Hadley bought it as the agent of the Bellows Falls Trust Company. The mill is located just south of this village near the Bellows Falls-Westminster line.

Hamilton Appoints Scott

W. C. Hamilton & Sons, Miquon, Pa., have announced the appointment of Norman E. Scott as New England representative, with offices at 89 Broad street, Boston, Mass.

Static Eliminator

Static electricity is, as its name implies, electricity at rest. There are two kinds of static charges, usually termed *positive* and *negative*. A body having equal quantities of positive and negative charges is in a state of static equilibrium and is said to be neutral, free from charge, or at earth potential. Paper, charged with electricity, is one material that is very troublesome on the cutters, layboys, printing presses, bag machines, and the like.

Static is very temperamental. Often, when several machines of identical design are handling the same material under the same conditions, one machine will be having a lot of static trouble and the others will be relatively free of static trouble.

When the material being processed is highly hygroscopic and there is no objection to increasing the relative humidity of the surrounding atmosphere, static problems may be considerably reduced by increasing the relative humidity. Conversely, when the material is highly nonabsorbent or it must be worked very dry to get a particular finish or attain a particular result, some other means must be devised to eliminate static electricity.

The most successful and the most logical method of removing static charges is to supply to the material by some electrical means, an opposite kind of charge.

It was to fill the following very definite needs that the Midget static eliminator was conceived and perfected:

(1) The need for an efficient static eliminator that would fit the smallest and most intricate machine, such as packaging, wrapping, folding, bag, envelope machines, rotary cutters, presses, etc.

(2) One that was so flexible in design that it could be applied to cover just one point, a row of points in a straight line, a row of points in a circle, points scattered all over the machine and points in the most inaccessible places.

(3) The need for a static eliminator that was so inexpensively priced that static bars could be applied at any number of places in a machine without greatly increasing the price.

(4) The need for a static eliminator with a very wide range of adjustment of its voltage and of the quantity of discharge of the points of the bar. For example, it may be necessary to handle a highly charged web of material running at high speed with points 1½ inches from the material with plenty of room for the bar, or a slow moving web with points ⅛ inch from the material with an extremely small space available for the bar. It may be that there is no fire hazard in the installation, in which case a high quantity of discharge of the points is not objectionable; or perhaps the bar will be working in an atmosphere of inflammable gases, in which case the discharge must be extremely small.

In addition to adapting itself to the smallest machine, the Midget will also fit the largest printing press, the largest papermaking and converting machine, and the largest and most complicated textile machine.

The static eliminator consists of a power unit arranged for plugging into a 110-volt, 60-cycle circuit, and also one or more static bars mounted right on the machine.

Each job is cared for individually and the equipment is designed to fit the particular application. The equipments are accompanied by complete and concise instructions for their installation, and any electrician or handy man can do the work. To obtain further information, operating data and prices, write to the Maxson Automatic Machinery Company, Westerly, R. I.

Gair Employees Play Golf

On Saturday, September 28, at the Rockland Country Club, Sparkill, N. Y., employees of the plants and offices of Robert Gair Company, Inc., held their Fourth Golf Tournament. The Gair Cartons Division, Piermont, N. Y., Eastern States Cartons Division, Brooklyn, N. Y., Bogota Paper and Board Corporation, Bogota, N. J., and the New York Office of the company were represented in the group of approximately 60 which attended.

The course was in excellent condition and the weather was made to order for the Gair golfers, who began teeing off at 9 A.M. Saturday. Scores turned in following the morning round were remarkable in their range, varying from 80, the lowest score, made by James Galgano of Piermont and an employee of the Piermont mill of the company, to 166, the highest score of the day.

An exciting moment occured when Anthony Komornick of the Piermont plant drove a perfect shot to the 13th green which rolled straight for the cup, but stopped four inches short of a hole-in-one.

George E. Dyke, President of the company, presented a silver cup to James Galgano as the best golfer at the tournament. Other prizes were presented by Wray R. Callaghan, folding carton sales manager at the New York Office, to the following: Harry Van Decker, H. Borman, Oscar Peterson and Joseph Hanousek of the Piermont plant and Messrs. S. Evans, Jr., H. Millar, Walter Hallback, Ed Sweeney, Fred England, L. B. Wright, Howard Smith, Harry Rossi and J. W. Duorr of the New York Office.

Others who attended were, Mrs. Helen Roth, forelady of the finishing department of the Piermont plant, Norman F. Greenway, first vice president of the company, Floyd C. Costello, vice president of the Bogota Company, Harry Van Decker, manager of the Piermont plant, Alex Israel, manager of the Brooklyn plant.

Also attending were Dennis Hogan, George Greenwood, Ed Moore, Clifford Moth, Elmer Curtiss, Fred Coursen, Joseph Grull, William Cavanaugh and Francis Smith of the Piermont plant; Charles Fast and L. H. Kyle of the Bogota plant; and L. B. Moss, William Trimble, Walter Ringle, S. R. Cahoon, H. Whitmore, George Rogers, W. R. Tietgen, A. Garrard, E. Towlen, W. Boyle, Peter Hauser, H. Woerner, Harry Morris, C. S. Reed, J. D. Malcolmson, G. Griesel and C. R. Bradley of the New York Office.

To Report on N.P.T.A. Meeting

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., October 7, 1940—John S. Blackman is to report on the proceedings at the recent convention of the National Paper Trade Association of the United States at a luncheon meeting of the Wrapping Paper Division of the New England Paper Merchants Association to be held Thursday, October 10, at the Boston Chamber of Commerce.

New York Paper and Pulp Market Review

Paper Market Less Active Than Year Ago With Production 5.4 Per Cent Under 1939 — Pulp Market Easy, Prices Unchanged — High Grade Rags Lower — Paper Stock Moving Rather Slow.

Office of the PAPER TRADE JOURNAL,
Wednesday, October 9, 1940.

Sales volume in the wholesale paper market continues to reflect the hesitant and cautious buying attitude commonly reported in other markets. Purchasing is being done largely for current needs and thus to keep inventories down to a conservative level. Uncertainty of the future, with the prospect of higher taxes, the changes expected to result from conscription, and a generally dismal outlook for world-wide peace and constructive international relations, are factors which appear to retard general business, not directly stimulated by orders covering national defense requirements. Despite these deterrent signs, wholesale sales of paper and many paper products are moderately good, according to reports received from many manufacturers' representatives, jobbers, and general paper merchants during the current week.

The index of general business activity rose to 108.6 per cent for the week ended September 28, from 108.5 per cent for the preceding week, compared with 102.0 per cent for the corresponding week last year.

Paper production of 232 mills for the week ended September 28, was estimated at 89.2 per cent, compared with 94.6 per cent for 1939, with 81.1 per cent for 1938, with 79.1 per cent for 1937, and with 84.3 per cent for the corresponding period for 1936.

Paper board production for the week ended September 28 was 78.0 per cent, compared with 82.0 per cent for 1939, with 69.0 per cent for 1938, with 71.0 per cent for 1937, and with 82.0 per cent for the corresponding period for 1936.

Moderate sales are reported in some quarters of the wholesale trade this week, with the lower and medium grades of bond papers among the most active. No particularly important change in demand has been reported in book paper. Fine paper sales are a bit slow. Kraft paper sales are levelling off. In general, the whole market is less active than during this period last year, with the trade expecting an upturn in demand in the near future. With any substantial increase in demand, higher paper and paper board prices would seem inevitable.

Mechanical Pulp

The mechanical pulp market continues unchanged from last week. Prices are easy and remain fairly firm on all grades of mechanical pulp.

Chemical Pulp

No important change in chemical pulp has been reported during the current week. The market is easy, with no change in prices reported on any grade of chemical pulp.

Rags

Mill buying of some of the higher grades of new rags continues moderately active this week, under the stimulation of lower prices on several grades. New white No. 1 shirt cuttings are down and currently quoted at from 6.50 to 6.75. No. 1 selesias are also lower and currently quoted at from 4.50 to 5.64, while O. D. khaki cuttings have dropped to 3.00 to 3.15. The only reported important upward price revision in the rag market this week is on No. 1 white, repacked old rags, which are higher and currently quoted at from 3.50 to 3.65.

Old Rope and Bagging

Mill buying of old Manila rope continues restricted and reported to be more sharply limited as supplies are declining. Prices hold unchanged.

The old bagging market continues to reflect the firmness reported last week. This is due to the normal functions of supply and demand. Reports consistently repeat the comment of decreasing supplies. No important changes in prices have occurred this week.

Old Waste Paper

The paper stock market is less active this week. No important change from prevailing representative market quotations on any grade of old waste paper has been reported to date.

Twine

The twine market is rather quiet this week. Prices are firm and the current price level is generally viewed in this market as too low to give a fair profit and any improvement in demand should advance prices to a more equitable level.

Standard Corrugated Case To Build

HOBOKEN, N. J., October 7, 1940—The Bonanno Construction Company, at North Bergen and Ridgefield, sold land to Standard Corrugated Case Corp., now located in Long Island City, and will erect for them a modern one-story factory building to contain approximately 74,000 square feet of floor space.

The Corporation is headed by Joseph Laskin, a pioneer in the manufacture and sale of corrugated box machinery and by his son, Max Laskin, who is now president of the firm.

The site embraces about 200,000 square feet of land with a frontage of 185 feet on Grand Avenue. The building to be erected will have a frontage of 130 feet and a depth of 520 feet.

Tileston & Hollingsworth Expand

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., October 7, 1940—The addition of two floors and a basement to the storehouse of Tileston & Hollingsworth at Hyde Park has been completed. The addition was made on account of increased business.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, October 9, 1940.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. Demand reported moderate for the week. The pulp is currently quoted at $35 per ton, in barrels, at works; the powder is offered at $50 per ton, f.o.b., works.

BLEACHING POWDER—Prices on bleaching powder are firm with demand continuing fair for the week. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Quotations on casein are reported a little lower for this week. Standard domestic casein, 20-30 mesh, is currently quoted at from 11½ to 13 cents per pound; 80-100 mesh, at from 12 to 14 cents per pound; all prices in bags, car lots. Standard Argentina casein is currently offered at from 11½ to 12 cents per pound. No quotations on French casein.

CAUSTIC SODA—Prices on caustic soda are firm and unchanged. Shipments continue in good volume. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged this week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—The demand for chlorine is reported steady. Prices are firm and continue unchanged for the current week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported as firm with prices lower for the week, "G" gum rosin is currently quoted at from $1.54 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at from $1.54 per 100 pounds, in barrels, New York.

SALT CAKE—Prices on salt cake are firm under a steady demand with current quotations continuing nominal. Domestic salt cake is currently quoted at $17 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point. The quotation of $20 per ton on imported salt cake continues nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Shipments reported in steady volume. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are reported firm and continue unchanged at prevailing market quotations. Pearl is currently quoted at $2.95 per 100 pounds; powdered starch at $3.05 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported steady for the week. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at $1.60 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mills. Quotations on imported talc are nominal.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.25	@	$5.75
Superstandard	4.87½	"	5.25
Northern Standard Wrapping	4.37½	"	4.62½
Standard Wrapping	4.25	"	—
Tissues—Per Ream—Carlots			
White No. 1	.97½	"	—
White No. 1 M. G.	.95	"	—
White No. 1½	.80	"	—
White No. 2	.75	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.85	"	—
Kraft	.87½	"	—
Manila	.77½	"	—
Unbl. Toilet, 1 M.	3.75	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.10	"	—
Bleached, Jr.	3.60	"	—
Manila—per cwt.—C. l. l. a.			
No. 1 Jute	8.25	@	10.25
No. 1 Manila Wrapping, 35 lb.	5.25	"	—
No. 2 Manila Wrapping, 35 lb.	5.00	"	—
Boards, per ton—			
News	35.00	@	40.00
Chip	35.00	"	40.00
Sgl. Mla. Ll. Chip	55.00	"	57.00
White Pat. Coated	67.00	"	70.00
Kraft Liners	55.00	"	—
Binders Boards	73.00	"	80.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.10	@ $46.00	$40.25	@ $47.25
100% Rag	31.05	" 36.50	32.20	" 37.75
85% Rag	....	"	29.90	" 35.00
75% Rag	23.60	" 27.75	24.75	" 29.00
65% Rag	....	"	21.65	" 26.25
50% Rag	17.55	" 21.50	18.70	" 22.75
25% Rag	14.65	" 17.75	15.80	" 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—
White, Assorted Items.
Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$9.35	@ $11.50	$11.55	@ $12.75
No. 2	8.50	" 10.25	9.65	" 11.75
No. 3	8.05	" 9.25	9.20	" 11.25
No. 4	7.70	" 9.50	8.90	" 10.75

Colors $1.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper.

Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	9.05	"	$10.50
No. 2 Offset	8.40	"	9.75
A Grade E. F.	8.20	"	9.50
A Grade S. & S. C.	8.45	"	9.75
B Grade E. F.	7.65	"	8.75
B Grade S. & S. C.	7.90	"	9.00
C Grade E. F.	7.35	"	8.50
C Grade S. & S. C.	7.60	"	8.75
D Grade E. F.	7.10	"	8.25
D Grade S. & S. C.	7.35	"	8.50

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	Nominal		
Dry	Nominal		
(Delivered)			
No. 1 Domestic and Canadian	45.00	@	46.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.72½	@	3.87½
Prime Qualities—			
Easy-Bleaching Sulphite	3.17½	"	3.71
Strong Unbleached Sulphite	3.17½	"	3.75
(On Dock, Atlantic Ports)			
Kraft Bleached	4.12½	"	
Kraft Light & Strong	3.50	"	3.71
Kraft No. 1	3.40	"	3.60
(F. o. b. Pulp Mill)			
Kraft Domestic and Canadian	2.75	"	3.37½
(Delivered)			
Soda Bleached	3.30	"	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.

Shirt Cuttings—			
New White, No. 1.	6.50	@	6.75
Silesias No. 1	4.50	"	4.65
New Unbleached	6.50	"	6.75
Blue Overall	4.35	"	4.50
Fancy	3.25	"	3.50
Washables	2.00	"	2.15
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.00	"	3.15

Old Rags

White, No. 1—			
Repacked	3.50	"	3.65
Miscellaneous	2.75	"	3.00
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	2.00	"	2.25
Miscellaneous	1.75	"	1.90
Roofing Rags—			
No. 1	.95	"	1.00
No. 2	.80	"	.85
No. 3 (bagging)	.90	"	1.00
No. 4	.60	"	.65
No. 5A	.60	"	.65

Foreign Rags

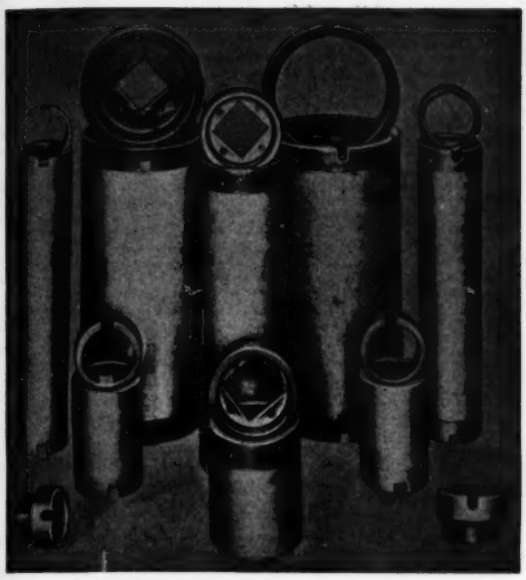
All prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.25
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxford	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	



ELIXMAN

CAPS — Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This new patented feature of reenforcement gives added strength and durability.

CORES

Samples of caps or cores will be gladly submitted

ELIXMAN PAPER CORE COMPANY, INC.
CORINTH, N. Y.

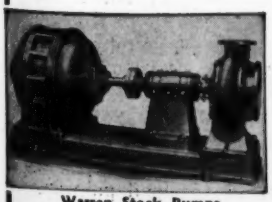
54 WARREN PUMPS

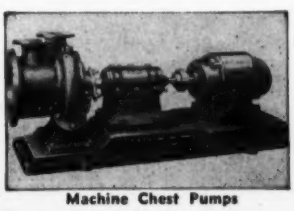
to be installed at the new Florida Pulp and Paper Company Pensacola Plant . . .

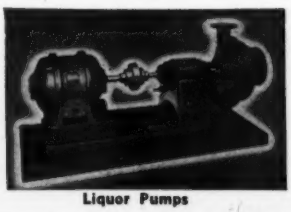
Why Warren? Because Warren paper mill pumps not only stay with their jobs and protect against costly service interruptions: they do their jobs, year after year, at consistently low operating and maintenance costs. For low pumping costs today *and tomorrow*, specify Warren.

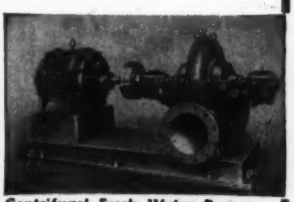
For All Paper Mill Requirements

WARREN STEAM PUMP COMPANY, INC., WARREN, MASSACHUSETTS


Warren Stock Pumps


Machine Chest Pumps


Liquor Pumps


Centrifugal Fresh Water Pumps

WARREN PUMPS

No. 4 White Linens	2.25	@	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o .b. N. Y.)

Gunny No. 1—			
Foreign	2.75	@	3.00
Domestic	2.50	"	2.75
Wool Tares, light	2.00	"	2.25
Wool Tares, heavy	2.12½	"	2.25
Bright Bagging	2.25	"	2.50
Manila Rope—			
Foreign	4.75	"	5.00
Domestic	4.50	"	4.75
Jute Threads	2.62½	"	2.75
Sisal Strings	2.10	"	2.35
Mixed Strings	1.10	"	1.20

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1	2.25	"	2.50
Soft White No. 1	1.80	"	1.90
Soft White Extra	2.50	"	2.60
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag.	.90	"	1.00
Solid Flat Book	.80	"	.85
Crumbled No. 1	.70	"	.75
Ledger White Stock	1.80	"	1.90
Ledger Stock Colored	1.30	"	1.40
Manila—			
New Env. Cut	1.70	"	1.80
New Cuttings	1.30	"	1.40
Old Kraft Machine Compressed bales	1.35	"	1.50
News—			
No. 1 White News	1.75	"	1.90
Strictly Overissue	.70	"	.75
Strictly Folded	.50	"	.55
Corrugated	.65	"	.67½
No. 1 Mixed Paper	.32½	"	.35

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.18	@	—
White Hemp	.18	"	—
Fine Polished—			
Fine India	.22	"	—
Unpolished—			
Box	.16	"	—
Paper Makers	.13	"	—
Tube Rope	.14¾	"	—
Wall Paper	.16	"	—
Wrapping	.16	"	—
Soft Fiber Rope	.14	"	—
Cotton	.24	"	—
(Hard Fiber)			
Medium Java	.10	"	—
Mex. Sisal	.09½	"	—
Manila	.23	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f.o.b. Phila.)

Shirt Cuttings—			
New White No. 1	.06½	@	.07
New White No. 2	.03½	"	.04
Light Silesias	—	"	.04½
Silesias, No. 1	—	"	.04
Black Silesias, soft	—	"	.03
New Unbleached	.06	"	.06¼
Washable Prints	.02¾	"	.02½
Washable, No. 1	—	"	.01¾
Blue Overall	.04	"	.04½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales	—	"	.03
New Black Soft	.02½	"	.02¾
New Light Seconds	—	"	.04
New Dark Seconds	—	"	1.50
Khaki Cuttings—			
No. 1 O. D.	.03½	"	.03¾
No. 2 Mixed	.01¾	"	.02
Corduroy	.01¾	"	.01½
New Canvas	.04½	"	.05
New Black Mixed	—	"	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.50	"	2.75
Thirds and Blues—			
Miscellaneous	1.35	"	1.50
Repacked	1.55	"	1.65
Black Stockings (Export)	3.50	"	4.00
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	—	"	.80
Domestic No. 2	—	"	.80
Roofing Bagging	—	"	.70

Bagging

(f.o.b. Phila.)

Gunny, No. 1—			
Foreign	Nominal		
Domestic	2.25	@	2.50
Manila Rope	—	"	4.75
Sisal Rope	1.75	"	2.00
Mixed Rope	.75	"	1.00
Scrap—			
No. 1	2.25	"	2.50
No. 2	—	"	1.50
Wool Tares, heavy	3.50	"	3.70
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	2.00	"	2.25

Old Papers

(f.o.b Phila.)

Shavings—			
No. 1 Hard White	2.40	@	2.50
No. 2 Hard White	2.10	"	2.15
No. 1 Soft White	2.00	"	2.10
No. 2 Soft White	1.60	"	1.75
No. 1 Mixed	.90	"	1.00
Solid Ledger Stock	1.90	"	2.00
Ledger Stock, white	1.75	"	1.80
Ledger Stock, colored	1.20	"	1.25
No. 1 Books, heavy	.85	"	.90
Manila Cuttings	1.75	"	1.80
Print Manila	.60	"	.65
Container Manila	.50	"	.55
Kraft Paper	1.40	"	1.50
No. 1 Mixde Paper	.45	"	.50
Straw Board Chip	.45	"	.50
Binders Board Chip	.45	"	.50
Corrugated Board	.65	"	.70
Overissue News	.75	"	.80
Old Newspapers	.50	"	.55

BOSTON

Old Papers

(f.o.b. Boston)

Shavings—			
No. 1 Hard White	2.75	@	3.00
No. 1 Soft White	2.00	"	2.25
No. 2 Mixed	.75	"	.80
Solid Ledger Books	1.50	"	1.75
Overissue Ledger Stock	1.75	"	2.00
Mixed Ledgers	.85	"	.90
No. 1 Heavy Books	1.10	"	1.20
No. 1 Books, light	.65	"	.75
Crumpled Stitchless Book Stock	.55	"	.65
Manila Env. Cuttings	1.85	"	2.00
Manila Envelope Cuttings, extra quality	2.35	"	2.60
White Blank News	1.40	@	1.50
No. 1 Kraft	1.35	@	1.40
Extra No. 1 Kraft	1.60	"	1.90
Mixed Papers	.35	"	.40
Print Manila	.50	"	.55
Container Manila	.60	"	.70
Old Newspapers	.50	"	.55
Paper Wool Strings	.95	"	1.10
Overissue News	1.00	"	1.10
Box Board Chips	.40	"	.45
Corrugated Boxes	.60	"	.65
Kraft Corrugated Boxes	1.05	"	1.15
New Kraft Corrugated Cuttings	1.50	"	1.65
Screening Wrappers	.60	"	.70

Bagging

(f.o.b. Boston)

Gunny Bagging—			
Foreign	—	"	2.35
Domestic	2.00	"	2.25
Sisal Rope	2.25	"	2.50
Mixed Rope	.85	"	1.00
Transmission Rope—			
Foreign	—	"	2.40
Domestic	2.25	"	2.40
Soft Jute Rope	3.00	"	3.25
Manila Rope—			
Foreign	4.75	"	5.00
Domestic	4.75	"	5.00
Jute Carpet Threads	1.50	"	1.75
Bleachery Burlap	4.00	"	3.25
Scrap Burlap—			
Foreign	2.35	"	2.50
Domestic	2.15	"	2.35
Scrap Sisal	2.25	"	2.50
Scrap Sisal for Shredding	2.30	"	2.65
Wool Tares—			
Foreign, Heavy	2.25	"	2.40
Domestic	2.40	"	2.50
Aust. Wool Pouches	2.75	"	3.00
New Burlap Cuttings	3.75	"	4.00
Heavy baling bagging	2.25	"	2.40
Paper Mill Bagging	1.75	"	2.00
No. 2 Bagging	.75	"	.80

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	—	@	.03
Fancy Percales	.04	"	.04¼
New White No. 1	.07½	"	.07¾
New Light Flannelettes	.05	"	.05¼
Canton Flannel, Bleached	.07	"	—
Silesias No. 1	.05	"	—
New Black Silesias	3.00	"	3.25
Red Cotton Cuttings	.04	"	.05
Soft Unbleached	.07	"	.07½
Blue Cheviots	.05	"	.05½
Fancy	.02	"	.02½
Washable	.02	"	.02½
Cottons—According to Grades—			
Blue Overalls	.04½	"	.05
New Black, Soft	.03	"	.03¼
Khaki Cuttings	.03	"	—
O. D. Khaki	.03	"	.03¼
Corduroy	.02¼	"	.03
New Canvas	.06¼	"	.07¼
B. V. D. Cuttings	.07	"	.07¼

Domestic Rags (Old)

(F. o.b. Boston)

White No. 1—			
Repacked	2.75	"	3.75
Miscellaneous	2.40	"	2.60
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues	1.50	"	2.00
Old Blue Overalls	1.60	"	2.00
Thirds and Blues—			
Repacked	—	"	1.25
Miscellaneous	—	"	1.00
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.00	"	1.25
No. 2	—	"	1.10
No. 3	—	"	.90

Foreign Rags

(F. o. b. Boston)

Canvas	.04¼	@	—
Dark Cottons	(nominal)		
Dutch Blues	(nominal)		
New Checks and Blues	(nominal)		
Old Fustians	(nominal)		
Old Linsey Garments	(nominal)		
New Silesias	(nominal)		

CHICAGO

Waste Paper

(f.o.b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	3.15	@	—
No. 1 Hard White	2.50	"	2.65
No. 1 Soft White	2.00	"	2.20
Ledger and Writings	.85	"	.95
Solid Books	.95	"	1.10
Blanks	1.50	"	1.60
Kraffts	1.40	"	1.50
New Kraft Cuts	1.60	"	1.75
Overissue News	1.00	"	1.10
Old Newspapers—			
No. 1 Folded News	.70	"	.80
No. 1 Mixed Paper	.40	"	.50
Roofing Stocks—			
No. 1	.95	@	1.00
No. 2	.85	"	.90

Pulp for Belgium and Netherlands

WASHINGTON, D. C., October 9, 1940—An agreement has been reached regarding the allotments for shipments of wood pulp by the European wood pulp cartel to Belgium and the Netherlands for the last 4 months of 1940. The headquarters of the cartel are to be in Berlin, according to a report from the office of the American Commercial Attache, Stockholm.

Under the terms of the agreement, the Netherlands will be supplied with approximately 12,000 tons of sulphite pulp for the remainder of this year. One-third will be supplied by Sweden, one-third by Germany and the remainder by all other cartel members. Of the 18,000 tons of sulphite, which it is estimated that Belgium will require, one-third will be supplied by Sweden, one-third by Germany, and the remainder by all other cartel members.

Both the Netherlands and Belgium will take 11,000 tons of sulphite wood pulp, 5,000 tons to be supplied by Sweden, 3,000 tons by Germany and the balance by all other countries. No decision has been made concerning the amount which Italy or France will receive for the remainder of the year, but it was stated that wood pulp prices for Italy would be approximately the same as in previous countries. According to the latest information, Sweden will receive the same price for its wood pulp as she does under existing contracts. Details concerning payments through German clearing are still under discussion.

Earlier information received from the Stockholm office stated that a rigid control of wood pulp production by the cartel was planned for all European wood pulp producing countries. Each European country is to have an export quota, as are the mills within a country.